



NOTICE OF WORK SESSION

In accordance with Section 38-431.01 of the Arizona Revised Statutes of the State of Arizona, notice is hereby given to the Members of City Council and to the general public that the Mayor and Council of the City of San Luis, Arizona will hold a Work Session meeting at 6:30 p.m. Wednesday, October 21, 2015. The meeting will take place at the City Council Chambers, located at 1090 East Union Street, San Luis, Arizona, 85349. Everyone from the public is invited to attend the open meeting.

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the City of San Luis does not discriminate on the basis of disability in the admission of or access to, or treatment of employment in its programs, activities, or services. For information regarding rights and provisions of the ADA or Section 504, or to request reasonable accommodations for participation in City programs, activities or services contact: ADA/Section 504 Coordinator, City of San Luis Human Resources Department, 1090 East Union Street, San Luis, Arizona 85349; (928) 341-8520.

Notice is hereby given that pursuant to A.R.S. §1-602.A.9, subject to certain specified statutory exceptions, parents have a right to consent before the State or any of its political subdivisions make a video or audio recording of a minor child. Meetings of the City Council are audio and/or video recorded, and, as a result, proceedings in which children are present may be subject to such recordings. Parents in order to exercise their rights may either file written consent with the City Clerk to such recordings, or take personal action to ensure that their child or children are not present when a recording may be made. If a child is present at the time a recording is made, the City will assume that the rights afforded parents pursuant to A.R.S. §1-602.A.9 have been waived.

THIS NOTICE IS APPROVED BY:

/s/ Sonia Cornelio, City Clerk

AVISO DE SESION DE TRABAJO

De acuerdo a la Sección 38-431.01 de los Estatutos Revisados del Estado de Arizona, se le informa a los Miembros del Cabildo y al público en general que el Alcalde y el Concilio de San Luis, Arizona, tendrán una Sesión de Trabajo a las 6:30 p.m. el día Miércoles, Octubre 21 del 2015. La junta se llevará a cabo en la Sala del Concilio, ubicada en el 1090 East Union Street, San Luis, Arizona, 85349, el público está cordialmente invitado.

De acuerdo con el Acta de Americanos con Discapacidades y la Sección 504 del Acta de Rehabilitación del 1973, la Ciudad de San Luis no discrimina por causa de discapacidad, la admisión y acceso a sus programas, actividades, servicios o en el trato en cuanto a empleo. Para más información referente a derechos y provisiones del Acta de Americanos con Discapacidades o Sección 504, o para solicitar adaptaciones que sean razonables para la participación en programas, actividades o servicios de la Ciudad, contactar al: Coordinador del Acta de Americanos con Discapacidades/Sección 504, Departamento de Recursos Humanos de la Ciudad de San Luis, 1090 East Union Street, San Luis, Arizona, 85349; (928) 341-8520.

Por medio de este aviso y de acuerdo con los Estatutos Revisados del Estado de Arizona, sujeto a ciertas excepciones reglamentarias, los padres de familia tienen el derecho de dar o no dar el consentimiento antes que el Estado o alguna subdivisión política grabe a un menor de edad, ya sea en audio o video. Las juntas del Concilio se graban en audio y/o video y como resultado, el hecho de que haya menores presentes puede ser sujeto a que sean grabados. Para que los padres de familia puedan ejercer sus derechos pueden solicitar por escrito con la Secretaria de la Ciudad a tal grabación, o tomar acción personal para asegurarse que su hijo/hija menor no esté presente cuando la grabación se lleve a cabo. Si un menor de edad está presente en el momento de la grabación, la Ciudad asumirá que los padres de familia están cediendo los derechos sobre una posible grabación de acuerdo con el Estatuto Revisado del Estado de Arizona §1-602.A.9.

ESTE AVISO ES APROBADO POR:

/f/ Sonia Cornelio, Actuaría de la Ciudad



AGENDA
Work Session
San Luis City Council
San Luis Council Chamber
1090 E. Union Street
October 21, 2015
6:30 P.M.

MEMBERS OF THE CITY COUNCIL WILL ATTEND EITHER IN PERSON, TELEPHONE, OR VIDEO CONFERENCE COMMUNICATION

1. **CALL TO ORDER/ROLL CALL 6:35 P.M.**

2. **ACTION ITEMS:**
 2. A. Discussion on any and all matters regarding the purchase of a new 4x4 Ford truck and a new 4x2 Ford truck for Wastewater Division, Public Works Department. **Discussed**
(Manuel Rojas, Assistant Public Works Director)

 2. B. Discussion on any and all matters regarding the purchase of a new 70hp Flygt sewer pump for Lift Station 300 for Public Works Department, Wastewater Division. **Discussed**
(Manuel Rojas, Assistant Public Works Director)

 2. C. Discussion on any and all matters regarding contract with James Davey and Associates, Inc. to provide design and engineering services associated with the improvements on Merrill Avenue. **Discussed**
(Jenny Torres, Community Development Director)

3. **DISCUSSION ITEMS:**
 3. A. Discussion on any and all matters regarding update on the proposed recreation sports complex. **Discussed**
(Jenny Torres, Community Development Director)

 3. B. Discussion on any and all matters regarding traffic studies and roadway needs for the Gadsden Elementary Schools Access Roads. **Discussed**
(Jenny Torres, Community Development Director)

 3. C. Discussion on any and all matters regarding the proposed downtown plan during agricultural season. **Discussed**
(Jenny Torres, Community Development Director)

 3. D. Discussion on any and all matters regarding the Right-of-Way Improvements on Urtuzuastegui Street from 10th Ave to 9th Ave, a 1,300 feet section on the North side of Urtuzuastegui Street. **Discussed**
(Manuel Rojas, Assistant Public Works Director)

3. E. Update on any and all matters regarding the side-walk project on 1st Avenue. **Discussed**
(Vice-Mayor Matias Rosales)
3. F. Discussion on any and all matters regarding the possible beautification and **Discussed**
maintenance of Urtuzuastegui Street. (Vice-Mayor Matias Rosales)
3. G. Update on any and all matters regarding a working plan to update the City of San **Discussed**
Luis Building Codes to current national codes. (Vice Mayor Matias Rosales)
4. **ADJOURNMENT 8:00 P.M.**

IN THE EVENT A MAJORITY OF THE COUNCIL IS NOT PRESENT, AN INFORMAL PUBLIC WORK SESSION MAY BE HELD.



AGENDA ITEM REVIEW FORM

City Council Work Session

2. A.

Meeting Date: 10/21/2015

Department Head: Eulogio Vera, Public Works Director, Public Works Department

Submitted By: Manuel Rojas, Assistant Public Works Director, Public Works Department

Action Requested:

ITEM:

Discussion on any and all matters regarding the purchase of a new 4x4 Ford truck and a new 4x2 Ford truck for Wastewater Division, Public Works Department. **(Manuel Rojas, Assistant Public Works Director)**

SUMMARY:

These new vehicle purchases are an approved request for the Fiscal Year 2015-2016 budget. We received a quote from Peoria Ford Company for a total purchase of \$58,893.58 through a cooperative contract. We will be using either the City of Phoenix or the Maricopa County Contract to make this purchase. Staff received quotes earlier this year, but with new models coming out for Ford Motor Company, the prices went up. The prices are compatible, still cheaper than Chevy Truck prices. Considering the savings in gas mileage, maintenance, service, and prior year expenditure totals, its feasible to cover additional costs from WW Vehicle Maintenance. Public Works Administration recommends the purchase of two new vehicles for Wastewater Division.

RECOMMENDATION / SUGGESTED MOTION:

Discussion only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information is attached to this Agenda Item Review Form.

Document to be Recorded?:

Fiscal Impact

| | |
|--|-------------|
| IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: | yes |
| CITY/STATE/FEDERAL FUNDS: | City |
| TOTAL: | \$58,893.58 |
| BUDGETED: | \$44,760.00 |
| AVAILABLE TO TRANSFER: | 14,133.58 |
| ACCOUNT #/REMAINING BALANCE: | \$18,378.29 |

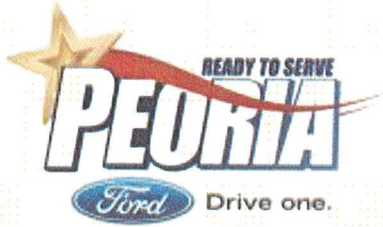
FISCAL IMPACT STATEMENT:

Staff received quotes earlier this year, with new models coming out for Ford Motor Company, the prices went up. The prices are compatible, still cheaper than Chevy Truck prices. Considering the savings in gas mileage, maintenance, service, and prior year expenditure totals, its feasible to cover additional costs from WW Vehicle Maintenance. The remaining balance in Vehicle Maintenance, Account # 310-311-70000 is \$18,378.29.

Attachments

Truck 1

Truck 2



VIN/STK

Scott Dingee
Commercial Account Manager
Peoria Ford
9130 West Bell Road
Peoria, Arizona 85382
Phone: 480-405-2929
Email: sdingee@peoriaford.com
Fax: 480-393-5536

City of San Louis

Gilberto Torres

2016 F-150 4x2 XL Crew Cab Long Bed V-8

| | |
|-------------|--------------------|
| MSRP | \$37,440.00 |
| Discount | \$12,065.08 |
| Sales Price | \$25,374.92 |

Subtotal \$25,374.92

Sales Tax \$2,055.37 8.10%

Doc Fee \$395.00

Total Amount Financed \$27,825.29

The rebate is in lieu of the factory interest rate, and using Ford Motor Credit Company to Finance.

Thank you for this opportunity to gain your business!

To place order, review for accuracy and fax back with signature and P.O. number (if applicable).

Signature: _____

Date: _____

Printed Name: _____

P.O.#: _____



Peoria Ford
9130 W. Bell Rd., Peoria, Arizona, 85382
Office: 623-977-8888 Fax: 623-877-8372

Customer Proposal

Prepared by:

Scott Dingee
Office: 623-977-8888
Email: sdingee@peoriaford.com

Date: 09/29/2015

Vehicle: 2016 F-150 XL
4x2 SuperCrew Cab Styleside 6.5' box 157"
WB





Selected Equipment & Specs

Dimensions

- * Exterior length: 243.7"
- * Exterior height: 75.7"
- * Turning radius: 25.6'
- * Max ground clearance: 8.7"
- * Rear legroom: 43.6"
- * Rear headroom: 40.4"
- * Rear hiproom: 64.7"
- * Rear shoulder room: 65.9"
- * Maximum cargo volume: 51.9cu.ft.
- * Exterior width: 79.9"
- * Wheelbase: 157.0"
- * Min ground clearance: 8.4"
- * Front legroom: 43.9"
- * Front headroom: 40.8"
- * Front hiproom: 62.5"
- * Front shoulder room: 66.7"
- * Passenger volume: 131.8cu.ft.
- * Box length: 78.0"

Powertrain

- * 385hp 5.0L DOHC 32 valve V-8 engine with Ti-VCT variable valve control, variable intake length, SMPI federal
- * Rear-wheel drive
- * Fuel Economy Highway: 22 mpg
- * Recommended fuel : regular unleaded
- * 6 speed automatic transmission with overdrive
- * Fuel Economy City: 15 mpg
- * Capless fuel filler

Suspension/Handling

- * Front independent double wishbone suspension with anti-roll bar, gas-pressurized shocks
- * Speed-sensing electric power-assist rack-pinion Steering
- * P245/70SR17 BSW AS front and rear tires
- * Rear rigid axle leaf spring suspension with gas-pressurized shocks
- * Front and rear 17 x 7.5 silver steel wheels

Body Exterior

- * 4 doors
- * Conventional right rear passenger
- * Black door mirrors
- * Bed-rail protectors
- * Easy lower tailgate
- * Box style: regular
- * Front and rear 17 x 7.5 wheels
- * Conventional left rear passenger
- * Driver and passenger power remote folding door mirrors
- * Black bumpers
- * Easy lift tailgate
- * Trailer harness
- * Clearcoat paint

Convenience

- * Manual air conditioning
- * Power windows
- * Driver and passenger 1-touch down
- * Manual tilt steering wheel
- * Day-night rearview mirror
- * Smart device integration
- * Front and rear cupholders
- * Driver and passenger door bins
- * Cruise control with steering wheel controls
- * Driver and passenger 1-touch up
- * Remote power door locks with 2 stage unlock and illuminated entry
- * Manual telescopic steering wheel
- * Wireless phone connectivity
- * 2 1st row LCD monitors
- * Passenger visor mirror
- * Rear door bins

Seats and Trim

- * Seating capacity of 6
- * 4-way driver seat adjustment
- * Centre front armrest
- * Front 40-20-40 split-bench seat
- * 4-way passenger seat adjustment
- * 60-40 folding rear split-bench seat

Entertainment Features

- * AM/FM stereo radio
- * SYNC external memory control

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



Selected Equipment & Specs (cont'd)

- * Steering wheel mounted radio controls
- * Wireless streaming
- * 6 speakers
- * Fixed antenna

Lighting, Visibility and Instrumentation

- * Halogen aero-composite headlights
- * Fully automatic headlights
- * Light tinted windows
- * Voltmeter
- * Outside temperature display
- * Trip computer
- * Delay-off headlights
- * Variable intermittent front windshield wipers
- * Tachometer
- * Oil pressure gauge
- * Low tire pressure warning
- * Trip odometer

Safety and Security

- * 4-wheel ABS brakes
- * 4-wheel disc brakes
- * ABS and driveline traction control
- * Dual seat mounted side impact airbag supplemental restraint system
- * Airbag supplemental restraint system occupancy sensor
- * Power remote door locks with 2 stage unlock and panic alarm
- * MyKey restricted driving mode
- * 3 manually adjustable rear head restraints
- * Hill hold control
- * Electronic stability
- * Dual front impact airbag supplemental restraint system
- * Safety Canopy System curtain 1st and 2nd row overhead airbag supplemental restraint system
- * Remote activated perimeter/approach lighting
- * Security system with SecuriLock immobilizer
- * Manually adjustable front head restraints

Dimensions

General Weights

| | | | |
|--------------------------|-----------|---------------------------|-----------|
| Curb | 4588 lbs. | GVWR | 6950 lbs. |
| Front GAWR | 3450 lbs. | Rear GAWR | 3800 lbs. |
| Payload | 2270 lbs. | Rear curb weight | 2719 lbs. |
| Rear curb weight | 1869 lbs. | Front spring rating | 3450 lbs. |
| Rear spring rating | 3800 lbs. | Front tire/wheel capacity | 3650 lbs. |
| Rear tire/wheel capacity | 4050 lbs. | | |

Trailer Type

| | | | |
|---------|-----|----------------------|-----|
| Harness | Yes | Trailer sway control | Yes |
|---------|-----|----------------------|-----|

General Trailing

| | | | |
|---------------------------|------------|-----------------|-----------|
| 5th-wheel towing capacity | 9000 lbs. | Towing capacity | 9100 lbs. |
| GCWR | 14200 lbs. | | |

Fuel Tank type

| | | | |
|----------|---------|---------------------|-----|
| Capacity | 23 gal. | Capless fuel filler | Yes |
|----------|---------|---------------------|-----|

Off Road

| | | | |
|----------------------|------|----------------------|-----|
| Min ground clearance | 8 " | Max ground clearance | 9 " |
| Load floor height | 36 " | | |

Exterior cargo

| | | | |
|---------------|-------------|------------------|--------|
| Length | 78.0 " | Minimum width | 50.6 " |
| Volume | 62.3 cu.ft. | Pickup box depth | 21.4 " |
| Maximum width | 65.2 " | Tailgate width | 60.3 " |

Interior cargo

| | |
|----------------------|-------------|
| Maximum cargo volume | 51.9 cu.ft. |
|----------------------|-------------|

Powertrain

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Selected Equipment & Specs (cont'd)

Engine Type

| | | | |
|------------------------|----------------|------------------|------------------|
| Block material | Aluminum | Cylinders | V-8 |
| Head material | Aluminum | Ignition | Electronic |
| Injection | Sequential MPI | Liters | 5.0L |
| Orientation | Longitudinal | Recommended fuel | Regular unleaded |
| Valves per cylinder | 4 | Valvetrain | DOHC |
| Variable valve control | Ti-VCT | | |

Engine Spec

| | | | |
|--------------|------------|-------------------|--------|
| Bore | 3.63" | Compression ratio | 10.5:1 |
| Displacement | 302 cu.in. | Stroke | 3.65" |

Engine Power

| | | | |
|--------|--------------------|--------|------------------------|
| Output | 385 HP @ 5,750 RPM | Torque | 387 ft.-lb @ 3,850 RPM |
|--------|--------------------|--------|------------------------|

Alternator

| | |
|------|-----|
| Amps | 200 |
|------|-----|

Battery

| | | | |
|---------------------|-----|--------------------|-----|
| Amp hours | 70 | Cold cranking amps | 610 |
| Run down protection | Yes | | |

Transmission

| | | | |
|--------------------|-----------|---------|-----|
| Electronic control | Yes | Lock-up | Yes |
| Overdrive | Yes | Speed | 6 |
| Type | Automatic | | |

Transmission Gear Ratios

| | | | |
|---------------------|------|-----|------|
| 1st | 4.17 | 2nd | 2.34 |
| 3rd | 1.52 | 4th | 1.14 |
| 5th | 0.86 | 6th | 0.69 |
| Reverse Gear ratios | 3.4 | | |

Transmission Torque Converter

| | |
|-------------|------|
| Stall ratio | 2.30 |
|-------------|------|

Transmission Extras

| | | | |
|------------------------|-----|--------------------------|-------------|
| Driver selectable mode | Yes | Sequential shift control | SelectShift |
|------------------------|-----|--------------------------|-------------|

Drive Type

| | |
|------|------------|
| Type | Rear-wheel |
|------|------------|

Drive Feature

| | |
|------------------|-------------------|
| Traction control | ABS and driveline |
|------------------|-------------------|

Drive Axle

| | |
|-------|------|
| Ratio | 3.31 |
|-------|------|

Exhaust

| | | | |
|----------|-----------------|-------------|--------|
| Material | Stainless steel | System type | Single |
|----------|-----------------|-------------|--------|

Emissions

| | | | |
|------|---------|-----|--------------|
| CARB | Federal | EPA | Tier 2 Bin 4 |
|------|---------|-----|--------------|

Fuel Economy

| | | | |
|-----------|----------|----------|--------|
| City | 15 mpg | Highway | 22 mpg |
| Fuel type | Gasoline | Combined | 18 mpg |

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Selected Equipment & Specs (cont'd)

Fuel Economy (Alternate 1)

| | | | |
|----------------|---------------|------------------|------------------|
| City Fuel type | 11 mpg E85 | Highway Combined | 16 mpg 13 mpg |
|----------------|---------------|------------------|------------------|

Acceleration

| | |
|--------------|------|
| 0-60 mph (s) | 5.92 |
|--------------|------|

1/4 Mile

| | | | |
|---------|------|-------|---------|
| Seconds | 14.3 | Speed | 101 mph |
|---------|------|-------|---------|

Skid Pad

| | |
|--------------------------|-----|
| Lateral acceleration (g) | 0.7 |
|--------------------------|-----|

Slalom

| | |
|-------|--------|
| Speed | 54 mph |
|-------|--------|

Green Values

| | | | |
|--|------|--|------|
| Energy Impact Score (Barrels per year) | 18.3 | Carbon FP / Tailpipe and upstream total GHG (CO2, tons per year) | 10.0 |
| Energy Impact Score (Barrels per year) | 5.8 | | |

Driveability

Brakes

| | | | |
|----------|-------------------------|------------------------------|---------------------|
| ABS Type | 4-wheel 4-wheel disc | ABS channels Vented discs | 4 Front and rear |
|----------|-------------------------|------------------------------|---------------------|

Brake Assistance

| | |
|-------------------|-----|
| Hill hold control | Yes |
|-------------------|-----|

Suspension Control

| | | | |
|------|---------|----------------------|----------------------------------|
| Ride | Regular | Electronic stability | Stability control with anti-roll |
|------|---------|----------------------|----------------------------------|

Front Suspension

| | | | |
|-------------------------------|------------------------|------|-----------------|
| Independence Anti-roll bar | Independent Regular | Type | Double wishbone |
|-------------------------------|------------------------|------|-----------------|

Front Spring

| | | | |
|------|------|-------|---------|
| Type | Coil | Grade | Regular |
|------|------|-------|---------|

Front Shocks

| | |
|------|-----------------|
| Type | Gas-pressurized |
|------|-----------------|

Rear Suspension

| | | | |
|--------------|------------|------|------|
| Independence | Rigid axle | Type | Leaf |
|--------------|------------|------|------|

Rear Spring

| | | | |
|------|------|-------|---------|
| Type | Leaf | Grade | Regular |
|------|------|-------|---------|

Rear Shocks

| | |
|------|-----------------|
| Type | Gas-pressurized |
|------|-----------------|

Steering

| | | | |
|-----------------------|--------------------|------------|-----------------------|
| Speed-sensing Type | Yes Rack-pinion | Activation | Electric power-assist |
|-----------------------|--------------------|------------|-----------------------|

Steering Specs

| | |
|-------------|---|
| # of wheels | 2 |
|-------------|---|

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Selected Equipment & Specs (cont'd)

Exterior

Front Wheels

Diameter 17" Width 7.50"

Rear Wheels

Diameter 17" Width 7.50"

Spare Wheels

Wheel material Steel

Front and Rear Wheels

Appearance Silver Material Steel
Covers Hub

Front Tires

Aspect 70 Diameter 17"
Sidewalls BSW Speed S
Tread AS Type P
Width 245mm

Rear Tires

Aspect 70 Diameter 17"
Sidewalls BSW Speed S
Tread AS Type P
Width 245mm

Spare Tire

Mount Underbody w/crankdown Type Full-size

Wheels

Turning radius 25.6' Wheelbase 157.0"

Body Features

Body material Aluminum Side impact beams Yes
Active grille shutters Yes

Body Doors

Door count 4 Left rear passenger Conventional
Right rear passenger Conventional Rear cargo Tailgate

Pickup

Box style Regular Bed-rail protectors Yes
Easy lift tailgate Yes Easy lower tailgate Yes

Exterior Dimensions

Length 243.7" Body width 79.9"
Body height 75.7" Frame section modulus 5.7cu.in.
Frame yield strength (psi) 49300.0 Front bumper to Front axle 37.8"

Safety

Airbags

Driver front-impact Yes Driver side-impact Seat mounted
Occupancy sensor Yes Overhead Safety Canopy System curtain 1st
and 2nd row
Passenger front-impact Yes Passenger side-impact Seat mounted

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Selected Equipment & Specs (cont'd)

| | | | |
|-------------------------------------|-------------------------|--------------------------------------|-----------------------|
| Seatbelt | | | |
| Rear centre 3 point Pre-tensioners | Yes Front | Height adjustable Pre-tensioners (#) | Front 2 |
| Security | | | |
| Immobilizer Restricted driving mode | SecuriLock MyKey | Panic alarm | Yes |
| Seating | | | |
| Passenger Capacity | | | |
| Capacity | 6 | | |
| Front Seats | | | |
| Split | 40-20-40 | Type | Split-bench |
| Driver Seat | | | |
| Fore/aft Way direction control | Manual 4 | Reclining | Manual |
| Passenger seat | | | |
| Fore/aft Way direction control | Manual 4 | Reclining | Manual |
| Front Head Restraint | | | |
| Control | Manual | Type | Adjustable |
| Front Armrest | | | |
| Centre | Yes | | |
| Rear Seats | | | |
| Descriptor Folding Type | Split-bench 60-40 Fixed | Facing Folding position | Front Fold-up cushion |
| Rear Head Restraints | | | |
| Control Number | Manual 3 | Type | Adjustable |
| Front Seat Trim | | | |
| Material | Vinyl | Back material | Vinyl |
| Rear Seat Trim Group | | | |
| Material | Vinyl | Back material | Carpet |
| Convenience | | | |
| AC And Heat Type | | | |
| Air conditioning | Manual | Underseat ducts | Yes |
| Audio System | | | |
| Radio Seek-scan | AM/FM stereo Yes | Radio grade External memory control | Regular SYNC |
| Audio Speakers | | | |
| Speaker type | Regular | Speakers | 6 |
| Audio Controls | | | |
| Steering wheel controls | Yes | Voice activation | Yes |

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Selected Equipment & Specs (cont'd)

| | | | |
|---------------------------------|------------------------------|-------------------------------|--------------------------------|
| Wireless streaming | Bluetooth yes | | |
| Audio Antenna | | | |
| Type | Fixed | | |
| LCD Monitors | | | |
| 1st row | 2 | Primary monitor size (inches) | 4.2 |
| Cruise Control | | | |
| Cruise control | With steering wheel controls | | |
| Convenience Features | | | |
| Retained accessory power | Yes | 12V DC power outlet | 3 |
| Wireless phone connectivity | Bluetooth | Smart device integration | App link |
| Door Lock Activation | | | |
| Type | Power with 2 stage unlock | Remote | Keyfob (all doors) |
| Integrated key/remote | Yes | Auto locking | Yes |
| Door Lock Type | | | |
| Rear child safety | Manual | Tailgate/rear door lock | Included with power door locks |
| Instrumentation Type | | | |
| Display | Analog | | |
| Instrumentation Gauges | | | |
| Tachometer | Yes | Oil pressure | Yes |
| Engine temperature | Yes | Voltmeter | Yes |
| Inclinometer | Yes | Transmission fluid temp | Yes |
| Instrumentation Warnings | | | |
| Oil pressure | Yes | Engine temperature | Yes |
| Battery | Yes | Lights on | Yes |
| Key | Yes | Low fuel | Yes |
| Lighting malfunction | Yes | Door ajar | Yes |
| Service interval | Yes | Brake fluid | Yes |
| Low tire pressure | Tire specific | | |
| Instrumentation Displays | | | |
| Clock | In-radio display | Exterior temp | Yes |
| Systems monitor | Yes | | |
| Instrumentation Feature | | | |
| PRND in IP | Yes | Trip computer | Yes |
| Trip odometer | Yes | | |
| Steering Wheel Type | | | |
| Material | Urethane | Tilting | Manual |
| Telescoping | Manual | | |
| Front Side Windows | | | |
| Window 1st row activation | Power | | |
| Windows Rear Side | | | |
| 2nd row activation | Power | | |
| Window Features | | | |
| 1-touch down | Driver and passenger | 1-touch up | Driver and passenger |

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Selected Equipment & Specs (cont'd)

| | | | |
|-------------------------|-----------------------|--------------------------|--------------|
| Tinted | Light | | |
| <i>Front Windshield</i> | | | |
| Wiper | Variable intermittent | | |
| <i>Rear Windshield</i> | | | |
| Window | Fixed | | |
| Interior | | | |
| <i>Passenger Visor</i> | | | |
| Mirror | Yes | | |
| <i>Rear View Mirror</i> | | | |
| Day-night | Yes | | |
| <i>Headliner</i> | | | |
| Coverage | Full | Material | Cloth |
| <i>Floor Trim</i> | | | |
| Coverage | Full | Covering | Vinyl/rubber |
| <i>Trim Feature</i> | | | |
| Gear shift knob | Urethane | Cabback insulator | Yes |
| Interior accents | Chrome | | |
| <i>Lighting</i> | | | |
| Dome light type | Fade | Illuminated entry | Yes |
| Variable IP lighting | Yes | | |
| <i>Storage</i> | | | |
| Driver door bin | Yes | Front Beverage holder(s) | Yes |
| Glove box | Yes | Passenger door bin | Yes |
| Rear yes | Yes | Instrument panel | Bin |
| Dashboard | Yes | Rear door bins | Yes |
| <i>Legroom</i> | | | |
| Front | 43.9" | Rear | 43.6" |
| <i>Headroom</i> | | | |
| Front | 40.8" | Rear | 40.4" |
| <i>Hip Room</i> | | | |
| Front | 62.5" | Rear | 64.7" |
| <i>Shoulder Room</i> | | | |
| Front | 66.7" | Rear | 65.9" |
| <i>Interior Volume</i> | | | |
| Passenger volume | 131.8 cu.ft. | | |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



Warranty - Selected Equipment & Specs

Warranty

Basic

Distance 36000 miles Months 36 months

Powertrain

Distance 60000 miles Months 60 months

Corrosion Perforation

Distance Unlimited miles Months 60 months

Roadside Assistance

Distance 60000 miles Months 60 months

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Selected Options

| Code | Description | MSRP |
|------------------------------|---|-------------|
| Base Vehicle | | |
| W1C | Base Vehicle Price (W1C) | \$33,940.00 |
| Packages | | |
| 101A | Equipment Group 101A Mid | \$1,505.00 |
| Powertrain | | |
| 99F | Engine: 5.0L V8 FFV | \$800.00 |
| 446 | Transmission: Electronic 6-Speed Automatic <i>Includes tow/haul mode.</i> | Included |
| X27 | 3.31 Axle Ratio | Included |
| NONGV1 | GVWR: 6,950 lbs Payload Package | Included |
| Wheels & Tires | | |
| STDTR | Tires: P245/70R17 BSW A/S | Included |
| 64C | Wheels: 17" Silver Steel | Included |
| Seats & Seat Trim | | |
| A | Vinyl 40/20/40 Front Seat | N/C |
| Other Options | | |
| 157WB | 157" Wheelbase | STD |
| 58B | Radio: AM/FM Stereo/Single-CD Player <i>Includes 6 speakers.</i> | Included |
| PAINT | Monotone Paint Application | STD |
| 55B | BoxLink <i>Includes 4 premium locking cleats.</i> | Included |
| Fleet Options | | |
| 85A | XL Power Equipment Group | Included |
| 52B | SYNC Voice Recognition Communications <i>Enhanced voice recognition communication and entertainment system. Includes 911 assist, 4.2" LCD display in center stack, Applink, 1 smart charging USB port, VHR, SYNC services, Bluetooth and steering wheel audio controls. Compass display in instrument cluster.</i> | Included |
| 50S | Cruise Control | Included |
| Interior Colors | | |
| AG | Medium Earth Gray | N/C |
| Primary Colors | | |
| YZ | Oxford White | N/C |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



Peoria Ford
9130 W. Bell Rd., Peoria, Arizona, 85382
Office: 623-977-8888

2016 F-150, SuperCrew Cab Styleside
4x2 SuperCrew Cab Styleside 6.5' box 157" WB
XL(W1C)

Selected Options (cont'd)

| Code | Description | MSRP |
|--------------------|--------------------|--------------------|
| SUBTOTAL | | \$36,245.00 |
| Destination Charge | | \$1,195.00 |
| TOTAL | | \$37,440.00 |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



VIN/STK

Scott Dingee
Commercial Account Manager
Peoria Ford
9130 West Bell Road
Peoria, Arizona 85382
Phone: 480-405-2929
Email: sdingee@peoriaford.com
Fax: 480-393-5536

City of San Louis
Gilberto Torres

2016 F-150 4x4 XL Crew Cab Long Bed V-8

| | |
|-------------|--------------------|
| MSRP | \$40,800.00 |
| Discount | \$12,425.08 |
| Sales Price | \$28,374.92 |

Subtotal \$28,374.92

| | | |
|-----------|------------|-------|
| Sales Tax | \$2,298.37 | 8.10% |
| Doc Fee | \$395.00 | |

Total Amount Financed **\$31,068.29**

The rebate is in lieu of the factory interest rate, and using Ford Motor Credit Company to Finance.

Thank you for this opportunity to gain your business!

To place order, review for accuracy and fax back with signature and P.O. number (if applicable).

Signature: _____ **Date:** _____
Printed Name: _____ **P.O.#:** _____



Peoria Ford
9130 W. Bell Rd., Peoria, Arizona, 85382
Office: 623-977-8888 Fax: 623-877-8372

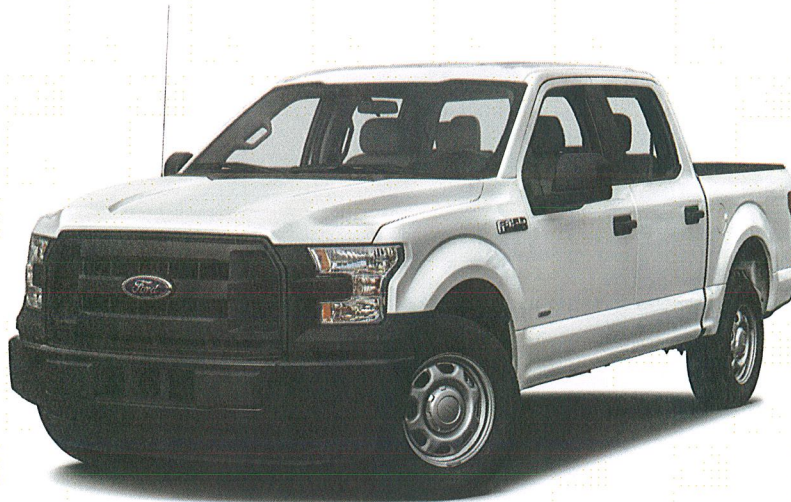
Customer Proposal

Prepared by:

Scott Dingee
Office: 480-205-2929
Email: sdingee@peoriaford.com

Date: 09/29/2015

Vehicle: 2016 F-150 XL
4x4 SuperCrew Cab Styleside 6.5' box 157"
WB





Selected Equipment & Specs

Dimensions

- * Exterior length: 243.7"
- * Exterior height: 77.3"
- * Turning radius: 25.6"
- * Max ground clearance: 10.2"
- * Rear legroom: 43.6"
- * Rear headroom: 40.4"
- * Rear hiproom: 64.7"
- * Rear shoulder room: 65.9"
- * Maximum cargo volume: 51.9cu.ft.
- * Exterior width: 79.9"
- * Wheelbase: 157.0"
- * Min ground clearance: 9.3"
- * Front legroom: 43.9"
- * Front headroom: 40.8"
- * Front hiproom: 62.5"
- * Front shoulder room: 66.7"
- * Passenger volume: 131.8cu.ft.
- * Box length: 78.0"

Powertrain

- * 385hp 5.0L DOHC 32 valve V-8 engine with Ti-VCT variable valve control, variable intake length, SMPI federal
- * Part-time
- * Fuel Economy Highway: 21 mpg
- * Recommended fuel : regular unleaded
- * 6 speed automatic transmission with overdrive
- * Fuel Economy City: 15 mpg
- * Capless fuel filler

Suspension/Handling

- * Front independent double wishbone suspension with anti-roll bar, gas-pressurized shocks
- * Speed-sensing electric power-assist rack-pinion Steering
- * P265/70SR17 OWL AT front and rear tires
- * Rear rigid axle leaf spring suspension with gas-pressurized shocks
- * Front and rear 17 x 7.5 silver steel wheels

Body Exterior

- * 4 doors
- * Conventional right rear passenger
- * Black door mirrors
- * Bed-rail protectors
- * Easy lower tailgate
- * Box style: regular
- * Front and rear 17 x 7.5 wheels
- * Conventional left rear passenger
- * Driver and passenger power remote folding door mirrors
- * Black bumpers
- * Easy lift tailgate
- * Trailer harness
- * Clearcoat paint

Convenience

- * Manual air conditioning
- * Power windows
- * Driver and passenger 1-touch down
- * Manual tilt steering wheel
- * Day-night rearview mirror
- * Smart device integration
- * Front and rear cupholders
- * Driver and passenger door bins
- * Cruise control with steering wheel controls
- * Driver and passenger 1-touch up
- * Remote power door locks with 2 stage unlock and illuminated entry
- * Manual telescopic steering wheel
- * Wireless phone connectivity
- * 2 1st row LCD monitors
- * Passenger visor mirror
- * Rear door bins

Seats and Trim

- * Seating capacity of 6
- * 4-way driver seat adjustment
- * Centre front armrest
- * Front 40-20-40 split-bench seat
- * 4-way passenger seat adjustment
- * 60-40 folding rear split-bench seat

Entertainment Features

- * AM/FM stereo radio
- * SYNC external memory control

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Selected Equipment & Specs (cont'd)

- * Steering wheel mounted radio controls
- * Wireless streaming
- * 6 speakers
- * Fixed antenna

Lighting, Visibility and Instrumentation

- * Halogen aero-composite headlights
- * Fully automatic headlights
- * Light tinted windows
- * Voltmeter
- * Outside temperature display
- * Trip computer
- * Delay-off headlights
- * Variable intermittent front windshield wipers
- * Tachometer
- * Oil pressure gauge
- * Low tire pressure warning
- * Trip odometer

Safety and Security

- * 4-wheel ABS brakes
- * 4-wheel disc brakes
- * ABS and driveline traction control
- * Dual seat mounted side impact airbag supplemental restraint system
- * Airbag supplemental restraint system occupancy sensor
- * Power remote door locks with 2 stage unlock and panic alarm
- * MyKey restricted driving mode
- * 3 manually adjustable rear head restraints
- * Hill hold control
- * Electronic stability
- * Dual front impact airbag supplemental restraint system
- * Safety Canopy System curtain 1st and 2nd row overhead airbag supplemental restraint system
- * Remote activated perimeter/approach lighting
- * Security system with SecuriLock immobilizer
- * Manually adjustable front head restraints

Dimensions

General Weights

| | | | |
|--------------------------|-----------|---------------------------|-----------|
| Curb | 4909 lbs. | GVWR | 7050 lbs. |
| Front GAWR | 3650 lbs. | Rear GAWR | 3800 lbs. |
| Payload | 2100 lbs. | Front curb weight | 2969 lbs. |
| Rear curb weight | 1940 lbs. | Front spring rating | 3650 lbs. |
| Rear spring rating | 3800 lbs. | Front tire/wheel capacity | 3650 lbs. |
| Rear tire/wheel capacity | 4050 lbs. | | |

Trailer Type

| | | | |
|---------|-----|----------------------|-----|
| Harness | Yes | Trailer sway control | Yes |
|---------|-----|----------------------|-----|

General Trailering

| | | | |
|---------------------------|------------|-----------------|-----------|
| 5th-wheel towing capacity | 8800 lbs. | Towing capacity | 8900 lbs. |
| GCWR | 14300 lbs. | | |

Fuel Tank type

| | | | |
|----------|---------|---------------------|-----|
| Capacity | 23 gal. | Capless fuel filler | Yes |
|----------|---------|---------------------|-----|

Off Road

| | | | |
|----------------------|------|----------------------|------|
| Min ground clearance | 9 " | Max ground clearance | 10 " |
| Load floor height | 36 " | | |

Exterior cargo

| | | | |
|---------------|-------------|------------------|--------|
| Length | 78.0 " | Minimum width | 50.6 " |
| Volume | 62.3 cu.ft. | Pickup box depth | 21.4 " |
| Maximum width | 65.2 " | Tailgate width | 60.3 " |

Interior cargo

| | |
|----------------------|-------------|
| Maximum cargo volume | 51.9 cu.ft. |
|----------------------|-------------|

Powertrain

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Selected Equipment & Specs (cont'd)

Engine Type

| | | | |
|------------------------|----------------|------------------|------------------|
| Block material | Aluminum | Cylinders | V-8 |
| Head material | Aluminum | Ignition | Electronic |
| Injection | Sequential MPI | Liters | 5.0L |
| Orientation | Longitudinal | Recommended fuel | Regular unleaded |
| Valves per cylinder | 4 | Valvetrain | DOHC |
| Variable valve control | Ti-VCT | | |

Engine Spec

| | | | |
|--------------|------------|-------------------|--------|
| Bore | 3.63" | Compression ratio | 10.5:1 |
| Displacement | 302 cu.in. | Stroke | 3.65" |

Engine Power

| | | | |
|--------|--------------------|--------|------------------------|
| Output | 385 HP @ 5,750 RPM | Torque | 387 ft.-lb @ 3,850 RPM |
|--------|--------------------|--------|------------------------|

Alternator

| | |
|------|-----|
| Amps | 200 |
|------|-----|

Battery

| | | | |
|---------------------|-----|--------------------|-----|
| Amp hours | 70 | Cold cranking amps | 610 |
| Run down protection | Yes | | |

Transmission

| | | | |
|--------------------|-----------|---------|-----|
| Electronic control | Yes | Lock-up | Yes |
| Overdrive | Yes | Speed | 6 |
| Type | Automatic | | |

Transmission Gear Ratios

| | | | |
|---------------------|------|-----|------|
| 1st | 4.17 | 2nd | 2.34 |
| 3rd | 1.52 | 4th | 1.14 |
| 5th | 0.86 | 6th | 0.69 |
| Reverse Gear ratios | 3.4 | | |

Transmission Torque Converter

| | |
|-------------|------|
| Stall ratio | 2.30 |
|-------------|------|

Transmission Extras

| | | | |
|------------------------|-----|--------------------------|-------------|
| Driver selectable mode | Yes | Sequential shift control | SelectShift |
|------------------------|-----|--------------------------|-------------|

Drive Type

| | | | |
|----------|-----------|------|------------|
| 4wd type | Part-time | Type | Four-wheel |
|----------|-----------|------|------------|

Drive Feature

| | | | |
|---------------------|-------------------|---------------------|------|
| Traction control | ABS and driveline | Locking hub control | Auto |
| Transfer case shift | Electronic | | |

Drive Axle

| | |
|-------|------|
| Ratio | 3.31 |
|-------|------|

Exhaust

| | | | |
|----------|-----------------|-------------|--------|
| Material | Stainless steel | System type | Single |
|----------|-----------------|-------------|--------|

Emissions

| | | | |
|------|---------|-----|--------------|
| CARB | Federal | EPA | Tier 2 Bin 4 |
|------|---------|-----|--------------|

Fuel Economy

| | | | |
|-----------|----------|----------|--------|
| City | 15 mpg | Highway | 21 mpg |
| Fuel type | Gasoline | Combined | 17 mpg |

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Selected Equipment & Specs (cont'd)

Fuel Economy (Alternate 1)

| | | | |
|----------------|---------------|------------------|------------------|
| City Fuel type | 11 mpg E85 | Highway Combined | 16 mpg 13 mpg |
|----------------|---------------|------------------|------------------|

Acceleration

| | |
|--------------|------|
| 0-60 mph (s) | 5.66 |
|--------------|------|

1/4 Mile

| | | | |
|---------|------|-------|--------|
| Seconds | 14.1 | Speed | 98 mph |
|---------|------|-------|--------|

Skid Pad

| | |
|--------------------------|-----|
| Lateral acceleration (g) | 0.7 |
|--------------------------|-----|

Slalom

| | |
|-------|--------|
| Speed | 54 mph |
|-------|--------|

Green Values

| | | | |
|--|------|---|------|
| Energy Impact Score (Barrels per year) | 19.4 | Carbon FP / Tailpipe and upstream total GHG (CO ₂ , tons per year) | 10.6 |
| Energy Impact Score (Barrels per year) | 5.8 | | |

Driveability

Brakes

| | | | |
|----------|-------------------------|------------------------------|---------------------|
| ABS Type | 4-wheel 4-wheel disc | ABS channels Vented discs | 4 Front and rear |
|----------|-------------------------|------------------------------|---------------------|

Brake Assistance

| | |
|-------------------|-----|
| Hill hold control | Yes |
|-------------------|-----|

Suspension Control

| | | | |
|------|---------|----------------------|----------------------------------|
| Ride | Regular | Electronic stability | Stability control with anti-roll |
|------|---------|----------------------|----------------------------------|

Front Suspension

| | | | |
|-------------------------------|------------------------|------|-----------------|
| Independence Anti-roll bar | Independent Regular | Type | Double wishbone |
|-------------------------------|------------------------|------|-----------------|

Front Spring

| | | | |
|------|------|-------|---------|
| Type | Coil | Grade | Regular |
|------|------|-------|---------|

Front Shocks

| | |
|------|-----------------|
| Type | Gas-pressurized |
|------|-----------------|

Rear Suspension

| | | | |
|--------------|------------|------|------|
| Independence | Rigid axle | Type | Leaf |
|--------------|------------|------|------|

Rear Spring

| | | | |
|------|------|-------|---------|
| Type | Leaf | Grade | Regular |
|------|------|-------|---------|

Rear Shocks

| | |
|------|-----------------|
| Type | Gas-pressurized |
|------|-----------------|

Steering

| | | | |
|-----------------------|--------------------|------------|-----------------------|
| Speed-sensing Type | Yes Rack-pinion | Activation | Electric power-assist |
|-----------------------|--------------------|------------|-----------------------|

Steering Specs

| | |
|-------------|---|
| # of wheels | 2 |
|-------------|---|

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Selected Equipment & Specs (cont'd)

Exterior

Front Wheels

Diameter 17" Width 7.50"

Rear Wheels

Diameter 17" Width 7.50"

Spare Wheels

Wheel material Steel

Front and Rear Wheels

Appearance Silver Material Steel
Covers Hub

Front Tires

Aspect 70 Diameter 17"
Sidewalls OWL Speed S
Tread AT Type P
Width 265mm

Rear Tires

Aspect 70 Diameter 17"
Sidewalls OWL Speed S
Tread AT Type P
Width 265mm

Spare Tire

Mount Underbody w/crankdown Type Full-size

Wheels

Turning radius 25.6' Wheelbase 157.0"

Body Features

Body material Aluminum Side impact beams Yes
Active grille shutters Yes

Body Doors

Door count 4 Left rear passenger Conventional
Right rear passenger Conventional Rear cargo Tailgate

Pickup

Box style Regular Bed-rail protectors Yes
Easy lift tailgate Yes Easy lower tailgate Yes

Exterior Dimensions

Length 243.7" Body width 79.9"
Body height 77.3" Frame section modulus 5.7cu.in.
Frame yield strength (psi) 49300.0 Front bumper to Front axle 37.8"

Safety

Airbags

Driver front-impact Yes Driver side-impact Seat mounted
Occupancy sensor Yes Overhead Safety Canopy System curtain 1st
and 2nd row
Passenger front-impact Yes Passenger side-impact Seat mounted

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Selected Equipment & Specs (cont'd)

| | | | |
|--|-------------------------------|--|--------------------------|
| Seatbelt | | | |
| Rear centre 3 point Pre-tensioners | Yes Front | Height adjustable Pre-tensioners (#) | Front 2 |
| Security | | | |
| Immobilizer Restricted driving mode | SecuriLock MyKey | Panic alarm | Yes |
| Seating | | | |
| Passenger Capacity | | | |
| Capacity | 6 | | |
| Front Seats | | | |
| Split | 40-20-40 | Type | Split-bench |
| Driver Seat | | | |
| Fore/aft Way direction control | Manual 4 | Reclining | Manual |
| Passenger seat | | | |
| Fore/aft Way direction control | Manual 4 | Reclining | Manual |
| Front Head Restraint | | | |
| Control | Manual | Type | Adjustable |
| Front Armrest | | | |
| Centre | Yes | | |
| Rear Seats | | | |
| Descriptor Folding Type | Split-bench 60-40 Fixed | Facing Folding position | Front Fold-up cushion |
| Rear Head Restraints | | | |
| Control Number | Manual 3 | Type | Adjustable |
| Front Seat Trim | | | |
| Material | Vinyl | Back material | Vinyl |
| Rear Seat Trim Group | | | |
| Material | Vinyl | Back material | Carpet |
| Convenience | | | |
| AC And Heat Type | | | |
| Air conditioning | Manual | Underseat ducts | Yes |
| Audio System | | | |
| Radio Seek-scan | AM/FM stereo Yes | Radio grade External memory control | Regular SYNC |
| Audio Speakers | | | |
| Speaker type | Regular | Speakers | 6 |
| Audio Controls | | | |
| Steering wheel controls | Yes | Voice activation | Yes |

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Selected Equipment & Specs (cont'd)

| | | | |
|---------------------------------|------------------------------|-------------------------------|--------------------------------|
| Wireless streaming | Bluetooth yes | | |
| Audio Antenna | | | |
| Type | Fixed | | |
| LCD Monitors | | | |
| 1st row | 2 | Primary monitor size (inches) | 4.2 |
| Cruise Control | | | |
| Cruise control | With steering wheel controls | | |
| Convenience Features | | | |
| Retained accessory power | Yes | 12V DC power outlet | 3 |
| Wireless phone connectivity | Bluetooth | Smart device integration | App link |
| Door Lock Activation | | | |
| Type | Power with 2 stage unlock | Remote | Keyfob (all doors) |
| Integrated key/remote | Yes | Auto locking | Yes |
| Door Lock Type | | | |
| Rear child safety | Manual | Tailgate/rear door lock | Included with power door locks |
| Instrumentation Type | | | |
| Display | Analog | | |
| Instrumentation Gauges | | | |
| Tachometer | Yes | Oil pressure | Yes |
| Engine temperature | Yes | Voltmeter | Yes |
| Inclinometer | Yes | Transmission fluid temp | Yes |
| Instrumentation Warnings | | | |
| Oil pressure | Yes | Engine temperature | Yes |
| Battery | Yes | Lights on | Yes |
| Key | Yes | Low fuel | Yes |
| Lighting malfunction | Yes | Door ajar | Yes |
| Service interval | Yes | Brake fluid | Yes |
| Low tire pressure | Tire specific | | |
| Instrumentation Displays | | | |
| Clock | In-radio display | Exterior temp | Yes |
| Systems monitor | Yes | | |
| Instrumentation Feature | | | |
| PRND in IP | Yes | Trip computer | Yes |
| Trip odometer | Yes | | |
| Steering Wheel Type | | | |
| Material | Urethane | Tilting | Manual |
| Telescoping | Manual | | |
| Front Side Windows | | | |
| Window 1st row activation | Power | | |
| Windows Rear Side | | | |
| 2nd row activation | Power | | |
| Window Features | | | |
| 1-touch down | Driver and passenger | 1-touch up | Driver and passenger |

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Selected Equipment & Specs (cont'd)

| | | | |
|-------------------------|-----------------------|--------------------------|--------------|
| Tinted | Light | | |
| <i>Front Windshield</i> | | | |
| Wiper | Variable intermittent | | |
| <i>Rear Windshield</i> | | | |
| Window | Fixed | | |
| Interior | | | |
| <i>Passenger Visor</i> | | | |
| Mirror | Yes | | |
| <i>Rear View Mirror</i> | | | |
| Day-night | Yes | | |
| <i>Headliner</i> | | | |
| Coverage | Full | Material | Cloth |
| <i>Floor Trim</i> | | | |
| Coverage | Full | Covering | Vinyl/rubber |
| <i>Trim Feature</i> | | | |
| Gear shift knob | Urethane | Cabback insulator | Yes |
| Interior accents | Chrome | | |
| <i>Lighting</i> | | | |
| Dome light type | Fade | Illuminated entry | Yes |
| Variable IP lighting | Yes | | |
| <i>Storage</i> | | | |
| Driver door bin | Yes | Front Beverage holder(s) | Yes |
| Glove box | Yes | Passenger door bin | Yes |
| Rear yes | Yes | Instrument panel | Bin |
| Dashboard | Yes | Rear door bins | Yes |
| <i>Legroom</i> | | | |
| Front | 43.9" | Rear | 43.6" |
| <i>Headroom</i> | | | |
| Front | 40.8" | Rear | 40.4" |
| <i>Hip Room</i> | | | |
| Front | 62.5" | Rear | 64.7" |
| <i>Shoulder Room</i> | | | |
| Front | 66.7" | Rear | 65.9" |
| <i>Interior Volume</i> | | | |
| Passenger volume | 131.8 cu.ft. | | |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



Selected Options

| Code | Description | MSRP |
|------------------------------|---|-------------|
| Base Vehicle | | |
| W1E | Base Vehicle Price (W1E) | \$38,100.00 |
| Packages | | |
| 101A | Equipment Group 101A Mid | \$1,505.00 |
| Powertrain | | |
| 99F | Engine: 5.0L V8 FFV | Included |
| 446 | Transmission: Electronic 6-Speed Automatic <i>Includes tow/haul mode.</i> | Included |
| X27 | 3.31 Axle Ratio | Included |
| STDGV | GVWR: 7,050 lbs Payload Package | Included |
| Wheels & Tires | | |
| STDTR | Tires: P265/70R17 OWL A/T | Included |
| 64C | Wheels: 17" Silver Steel | Included |
| Seats & Seat Trim | | |
| A | Vinyl 40/20/40 Front Seat | N/C |
| Other Options | | |
| 157WB | 157" Wheelbase | STD |
| 58B | Radio: AM/FM Stereo/Single-CD Player <i>Includes 6 speakers.</i> | Included |
| PAINT | Monotone Paint Application | STD |
| 55B | BoxLink <i>Includes 4 premium locking cleats.</i> | Included |
| Fleet Options | | |
| 85A | XL Power Equipment Group | Included |
| 52B | SYNC Voice Recognition Communications <i>Enhanced voice recognition communication and entertainment system. Includes 911 assist, 4.2" LCD display in center stack, Applink, 1 smart charging USB port, VHR, SYNC services, Bluetooth and steering wheel audio controls. Compass display in instrument cluster.</i> | Included |
| 50S | Cruise Control | Included |
| Interior Colors | | |
| AG | Medium Earth Gray | N/C |
| Primary Colors | | |
| YZ | Oxford White | N/C |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



Peoria Ford
9130 W. Bell Rd., Peoria, Arizona, 85382
Office: 623-977-8888

2016 F-150, SuperCrew Cab Styleside
4x4 SuperCrew Cab Styleside 6.5' box 157" WB
XL(W1E)

Selected Options (cont'd)

| Code | Description | MSRP |
|--------------------|--------------------|--------------------|
| SUBTOTAL | | \$39,605.00 |
| Destination Charge | | \$1,195.00 |
| TOTAL | | \$40,800.00 |

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.

Prepared by: Scott Dingee | Date: 09/29/2015 | Price Level: 615 | Quote ID: sanlouis3



AGENDA ITEM REVIEW FORM

City Council Work Session

2. B.

Meeting Date: 10/21/2015

Department Head: Eulogio Vera, Public Works Director, Public Works Department

Submitted By: Manuel Rojas, Assistant Public Works Director, Public Works Department

Action Requested:

ITEM:

Discussion on any and all matters regarding the purchase of a new 70hp Flygt sewer pump for Lift Station 300 for Public Works Department, Wastewater Division. **(Manuel Rojas, Assistant Public Works Director)**

SUMMARY:

During the upgrade of Lift Station 300, 100hp Vaughn sewer pumps were installed. Over the years, staff has been repairing the sewer pumps every 2-3 years with an initial cost of \$12,000 and currently it has increased to \$17,000.00 per event, we currently have 3 pumps at subject location. Wastewater staff is looking for alternative pump brands that will provide efficiency, energy saving and minimized maintenance costs. In our collection system, we have several Flygt sewer pumps, they have been working trouble free, other than general maintenance. With the installation of a new 70hp Flygt sewer pump, we will be saving on electricity, 30hp pump difference due to design, hardened iron impeller/ring, and maintenance costs. Staff recommends the purchase of new Flygt sewer pump for Lift Station 300. This is a sole-source vendor.

RECOMMENDATION / SUGGESTED MOTION:

Discussion only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information is attached to this Agenda Item Review Form

Document to be Recorded?:

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: Yes

| | |
|-------------------------------------|--------------|
| CITY/STATE/FEDERAL FUNDS: | City |
| TOTAL: | \$45,215.50 |
| BUDGETED: | \$40,100.00 |
| AVAILABLE TO TRANSFER: | \$5,115.50 |
| ACCOUNT #/REMAINING BALANCE: | \$138,445.01 |

FISCAL IMPACT STATEMENT:

With purchase of Flygt 70hp sewer pump, the City will be saving in energy cost due to higher efficiency and maintenance costs, covering the additional costs within warranty period. The new pump hard impeller and ring is more suitable for our chopper pump sewer application.

Budgeted from Account #310-31-90000 Priority Spare Parts
Transfer from Account # 310-311-70025 Maintenance/Other

Balance remaining in Maintenance/ Other Account is \$138,445.01

Attachments

Flygt Pump Quote
Flygt Pumps Warrenty



3501 E. Broadway Road Phoenix, AZ 85040-2833 Phone: (602) 243-0585 Fax: (602) 276-5402 www.jchinc.com

QUOTATION # 20151008-BPL

Page 1 of 1

OCTOBER 8, 2015

To: CITY OF SAN LUIS

Job Name: REPLACEMENT FLYGT PUMP
FOR SAN LUIS LS # 300

Attn: GILBERTO

Location: SAN LUIS, AZ

Quotation By: Bruce P. Loring, P.E.

Bid Date: ASAP

Unless otherwise stated: Prices are firm for 30 days from bid date, payment terms are NET 30 DAYS from shipment. Prices do not include any sales and/or use taxes. Applicable taxes will be added to the invoice at the rate in effect at the time of shipment. Interest shall accrue on past due amounts at 1.5% per month. Freight terms are F.O.B. factory, full freight allowed.

| Qty | Description | Each | Total |
|-----|---|--------------|-------------|
| | LIFT STATION # 300 VAUGHAN REPLACEMENT PUMP | FLYGT | |
| 1 | FLYGT MODEL NP-3202x-458 FM LISTED (HARD IRON) WITH 70 HP, 480/3/60 MOTOR WITH 75 FEET OF POWER CABLE. PUMP WILL BE SUPPLIED WITH DRILLED 6 INCH ANSI FLANGE (TO MOUNT TO VAUGHAN SLIDING BRACKET TO FIT EXISTING GUIDE RAIL SYSTEM). | | \$39,488.00 |
| 1 | FLYGT MINI-CAS RELAY AND BASE (TO BE MOUNTED INTO EXISTING CONTROL PANEL BY OTHERS). MUST BE CONFIGURED TO ALLOW FOR PUMP SHUT DOWN FOR AN OVERTEMP AND/OR MOISTURE ALARM) | | Included |

Note:

This pump is identical to the performance of the exiting pumps and carries the standard FLYGT five (5) year warranty. This pump also carries the now standard 12 month non-clog guarantee.

STD SHIPPING: 10-14 WEEKS A.R.O.
F.O.B. FACTORY, FULL FREIGHT ALLOWED
(SURFACE TRUCK FREIGHT PAID TO SAN LUIS)
PLUS APPLICABLE TAXES

Additional costs requested:

| | |
|--------------------------|-------------|
| Freight to project site | \$ 1,200.00 |
| Start-up (1 Trip, ½ day) | \$ 1,250.00 |
| Tax (based on 8.3%) | \$ 3,277.50 |



WARRANTY

Xylem Water Solutions USA, Inc.

For the period defined, Xylem Water Solutions USA, Inc. offers a commercial warranty to the original End Purchaser against defects in workmanship and material on Flygt Products. Warranty covers Flygt parts and labor as outlined in **ADDENDUM – A**.

COVERAGE:

Xylem Water Solutions USA, Inc. will pay the cost of parts and labor during the warranty period, provided that the Flygt product, with cable attached, is returned prepaid to a Xylem Water Solutions USA, Inc. Authorized Service Facility for Flygt Product repairs. Coverage for Flygt parts and labor will be provided for the period shown in **ADDENDUM - A**. The warranty period will begin from date of shipment or date of a valid Start-up (For permanently installed pumps only). In cases where the Start-up date is used as the beginning of the warranty on a permanently installed Flygt pump, a Start-up Report completed by an approved service technician from a Xylem Water Solutions USA, Inc. Authorized Service Facility for Flygt products must be received by the Xylem Water Solutions USA, Inc. Area Service Manager for Flygt Products within thirty (30) days of the initial onset of the unit placed into service. If not received, the beginning of the warranty coverage will default to the Flygt product ship date. A Start-up for a permanently installed Flygt pump must occur within one (1) year from the date of shipment from a Xylem Water Solutions USA, Inc. authorized facility for Flygt Products or warranty will automatically default to ship date as start of warranty. (See **STORAGE** section) When using the start-up date as the beginning of the warranty, a copy of the Start-up Report will be required to support any Warranty Claims. Warranty on Flygt Dewatering pumps will begin with ship date only. No other date on Flygt Dewatering pumps will be considered.

Xylem Water Solutions USA, Inc.'s sole obligation under this Warranty for Flygt Products shall be to replace, repair or grant credit for Flygt Products upon Xylem Water Solutions USA, Inc.'s exclusive determination that the Flygt Product does not conform to the above warranty. In the event that the Flygt product is replaced, warranty on the replacement product will be equal to the balance remaining on the original product or ninety (90) days, which ever is greater.

MISUSE:

This Warranty shall not apply to any Flygt product or part of Flygt product which (i) has been subjected to misuse, misapplication, accident, alteration, neglect, or physical damage (ii) has been installed, operated, used and/or maintained in a manner which is in an application that is contrary to Xylem Water Solutions USA, Inc.'s printed instructions as it pertains to installation, operation and maintenance of Flygt Products, including but without limitation to (iii) operation of equipment without being connected to monitoring devices supplied with specific products for protection; or (iv) damaged due to a defective power supply, improper electrical protection, faulty installation or repair, ordinary wear and tear, corrosion or chemical attack, an act of God, an act of war or by an act of terrorism; or (v) has been damaged resulting from the use of accessory equipment not sold by Xylem Water Solutions USA, Inc. or not approved by Xylem Water Solutions USA, Inc. in connection with Flygt products.

WEAR PARTS:

This warranty does not cover costs for standard and/or scheduled maintenance performed, nor does it cover Flygt parts that, by virtue of their operation, require replacement through normal wear (aka: Wear Parts), unless a defect in material or workmanship can be determined by Xylem Water Solutions USA, Inc.. Wear Parts are defined as Cutters, Cutting Plates, Impellers, Agitators, Diffusers, Wear Rings (Stationary or Rotating), Volutes (when used in an abrasive environment), oil, grease, cooling fluids and/or any items deemed necessary to perform and meet the requirements of normal maintenance on all Flygt equipment.



WARRANTY

Xylem Water Solutions USA, Inc.

DISCLAIMERS:

(i) Xylem Water Solutions USA, Inc.'s warranties are null and void when Flygt Products are exported outside of the United States of America without the knowledge and written consent of Xylem Water Solutions USA, Inc.; (ii) Xylem Water Solutions USA, Inc. makes no independent warranty or representation with respect to parts or products manufactured by others and provided by Xylem Water Solutions USA, Inc. (however, Xylem Water Solutions USA, Inc. will extend to the Purchaser any warranty received from Xylem Water Solutions USA, Inc.'s supplier for such parts or products).

LIMITATIONS:

XYLEM WATER SOLUTIONS USA, INC. NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON OR COMPANY TO ASSUME FOR XYLEM WATER SOLUTIONS USA, INC., ANY OTHER OBLIGATION IN CONNECTION WITH THE SALE OF ITS FLYGT EQUIPMENT. ANY ENLARGEMENT OR MODIFICATION OF THIS WARRANTY BY A FLYGT PRODUCT DISTRIBUTOR, OR OTHER SELLING AGENT SHALL BECOME THE EXCLUSIVE RESPONSIBILITY OF SUCH ENTITY.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, CONDITIONS OR TERMS OF WHATEVER NATURE RELATING TO FLYGT PRODUCT(S), INCLUDING AND WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED. PURCHASER'S EXCLUSIVE REMEDY AND XYLEM WATER SOLUTIONS USA, INC.'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES IS LIMITED TO REPAIRING OR REPLACING FLYGT PRODUCTS AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE PURCHASER HEREUNDER. IN NO EVENT IS XYLEM WATER SOLUTIONS USA, INC. LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION.

XYLEM WATER SOLUTIONS USA, INC. WILL NOT BE HELD RESPONSIBLE FOR TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR'S FEES, OR ANY EXPENSES ASSOCIATED WITH A FLYGT PRODUCT REPAIR SHOP NOT AUTHORIZED BY XYLEM WATER SOLUTIONS USA, INC. U.S.A., INC. REIMBURSEMENT COSTS FOR CRANES AND/OR ANY SPECIAL EQUIPMENT USED IN CONJUNCTION FOR THE REMOVAL AND/OR REINSTALLATION OF ANY FLYGT EQUIPMENT IS NOT COVERED UNDER THIS WARRANTY.

ANY UNAUTHORIZED ALTERATIONS TO SUPPLIED FLYGT EQUIPMENT USED WITHOUT XYLEM WATER SOLUTIONS USA, INC. SUPPLIED FLYGT BRAND CABLE OR CONTROLS WILL NOT BE COVERED UNDER THIS WARRANTY, UNLESS IT CAN BE PROVEN SUCH ANCILLARY EQUIPMENT IS SUITABLE FOR THE PURPOSE AND EQUAL TO XYLEM WATER SOLUTIONS USA, INC. SUPPLIED FLYGT BRAND CABLES OR CONTROLS THAT WOULD ORIGINALLY HAVE BEEN SUPPLIED WITH THE TYPE OF EQUIPMENT IN USE.

REQUIREMENTS:

A copy of Electrical System Schematics of the Control used (including a Control's Bill of Material) could be required to support a Warranty Claim when a non Flygt Brand Control is used. In addition, a written record, hereby known as "the log", will be associated with each unit serial number and must be maintained by the organization having product maintenance responsibility. The log must record each preventative maintenance activity and any repair activity during the life of the warranty or verification that a Xylem Water Solutions USA, Inc. authorized Service Contract for Flygt Products is in force and must be available for review and/or auditing. Failure to meet these conditions could render this warrant null and void. Such logs could be required to determine warranty coverage.



WARRANTY

Xylem Water Solutions USA, Inc.

STORAGE:

Should a delay occur between ship date and the date of start-up, maintenance as outlined in Xylem Water Solutions USA, Inc.'s Care & Maintenance Manual for Flygt Products must be performed by the "CONTRACTOR" and/or "OWNER" during any such period of storage. Documentation providing proof and outlining what maintenance was performed must be provided to Xylem Water Solutions USA, Inc. or its Flygt Products representative within thirty (30) days of said maintenance, or the Xylem Water Solutions USA, Inc. warranty for Flygt Products could be considered void.

CONTROLS:

Warranty coverage for permanently installed controls will start for the end purchaser on the date of shipment. This warranty does not apply to controls that have been damaged due to a defective and/or improper input power supply, improper electrical protection, accidental damage, improper or unauthorized installation and/or repair, unauthorized alteration, negligence, environmental corrosion or chemical attack, improper maintenance or storage of control, any act of God, an act of war, an act of terrorism or damage resulting from the use of accessory equipment not approved by Xylem Water Solutions USA, Inc.. Further, this warranty does not apply in the event an adjustment is found to correct the alleged defect.

Solid state devices will be covered for a period of one (1) year. Electrical control panels containing controllers, PLC's, drives, soft starts, and other computerized equipment will require Transient Voltage Surge Suppression (TVSS) protection in order to satisfy the requirements of this warranty. The protection equipment associated with the control must be kept in working condition during the life of the warranty. Auxiliary equipment supplied with the control (air-conditioners etc.) is limited by the respective original equipment manufacturer's warranty offered. Consumable items such as: light bulbs, fuses, and relays are covered under normal operating conditions. Electrical surges experienced during startups and/or during normal operating use of the control panel will cause the consumable items not to be covered under this warranty policy. Components not supplied by Xylem Water Solutions USA, Inc. will not be covered by this warranty.

TOP (The Optimum Pump Station)

Xylem Water Solutions USA, Inc. will warrant the Flygt TOP pre-engineered fiberglass pump station components against defects in material and workmanship for a period of one (1) year from date of start-up or eighteen (18) months from date of shipment and is valid only to the original owner of the station. Warranty shall cover the cost of labor and materials required to correct any warrantable defect, excluding any removal and reinstallation costs, FOB Xylem Water Solutions USA, Inc.'s authorized warranty service location for Flygt's TOP.

Flygt Products contained within a TOP pre-engineered fiberglass pump station will carry the standard Xylem Water Solutions USA, Inc. warranty for Flygt products and/or accessories installed in the TOP pre-engineered fiberglass pump station.

All Flygt Product restrictions and/or limitations as outlined and described within the context of this warranty are germane to all sections of this Xylem Water Solutions USA, Inc. Warranty document.

Xylem Water Solutions USA, Inc.
National Quality Assurance - US Corporate



WARRANTY

Xylem Water Solutions USA, Inc.

ADDENDUM – WARRANTY COVERAGE BY PRODUCT

| PRODUCT | PRODUCT SERIES AND CONFIGURATION | Months | Months | Months | Months | Months |
|---|--|-----------------------|------------------|---------|---------|---------|
| | | 1 - 12 | 13 - 18 | 19 - 36 | 37 - 39 | 40 - 60 |
| Axial Flow/ Mixed Flow/ Centrifugal Pumps & Mixers | 3000 Series (CP, NP, DP, CT, NT, CZ, LL) 4000 Series (SR, PP) 7000 Series (PL) | 100% | | 50% | | 25% |
| Electrical Control Panels (permanently installed) | Xylem Manufactured Control Panels - 3 - Years | 100% - 1 YR | LIMITED - 2 - YR | | | |
| Abrasion/Corrosion Resistant & Chopper/ Grinder Pumps | 3000 Series (MP, MF, MH, FS, FP, HP, HS) 5000 Series (HP, HS) 8000.280 Series (DP, DZ, DT, DS, DF) | 100% | | | | |
| Dewatering Pumps | 2000 Series (BS, KS) 3000 Series (CS, NS, DS) 8000.280 Series (DS, DF) | 100% (From Ship Date) | | | | |
| TOPS & PSS | Fiberglass Pump Station | 100% (From Ship Date) | | | | |
| Accessories | Permanent / Portable | 100% (From Ship Date) | | | | |
| Hydro ejectors/ Aerators | HE, JA | 100% | | | | |
| Portable Pump Controls | Control Boxes (Nolta, MSHA etc.) | 100% (From Ship Date) | | | | |
| Small Pumps | 3045, 3057, SX | 100% (From Ship Date) | | | | |
| Parts - * | All new spare parts | 100% (From Ship Date) | | | | |

* - Parts that fail where used in a repair are warranted for one (1) year from the date of the repair for the failed part only – no labor.





AGENDA ITEM REVIEW FORM

City Council Work Session

2. C.

Meeting Date: 10/21/2015

Department Head: Jenny Torres, Community Development Director, Community Development Department

Submitted By: Dania Castillo, Economic Development Assistant, Community Development Department

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding contract with James Davey and Associates, Inc. to provide design and engineering services associated with the improvements on Merrill Avenue. (**Jenny Torres, Community Development Director**)

SUMMARY:

The City of San Luis intends to apply for \$300,000 in CDBG funds from the State Special Projects (SSP) account from the Arizona Department of Housing to improve Merrill Avenue. This is a competitive round of funding in which applicants must submit engineering design and construction plans as part of the grant application. We are requesting to award engineering contract in the amount of \$22,805 to James Davey and Associates for the design of this project.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information attached to this Agenda Item Review Form

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: Yes

CITY/STATE/FEDERAL FUNDS: City

TOTAL: \$22,805

BUDGETED: \$20,000

AVAILABLE TO TRANSFER: 22,805

ACCOUNT #/REMAINING BALANCE: 200-210-81100/\$92,000

FISCAL IMPACT STATEMENT:

Funds in the amount of \$20,000.00 will come from Public Works, 200-210-81100, Transfers Out line and, the remainder of \$2,805 to be transferred from 200-210-80001, Professional Services line.

Attachments

Contract

AGREEMENT FOR ENGINEERING SERVICES

This Agreement is made on the ____ day of _____, 2015, between the City of San Luis, Arizona, a municipal corporation of the State of Arizona, ("City"), and James Davey and Associates of Yuma, Arizona, having a principal being a registered engineer of the State of Arizona ("Engineer"):

Witness:

By this agreement the City hereby engages the services of Engineer for the following described project ("Project"): Merrill Avenue Improvements

This project is being undertaken by the City of San Luis, Arizona and is to implement such improvements under the general direction of the State of Arizona Department of Housing, Community Development Block Grant Program, (CDBG) set aside from the State Special Projects (SSP).

The accomplishment of the work and services described in this Agreement is necessary and essential to the public works improvement program of the City; and

The City desires to engage the Engineer to render professional engineering services for the project described in this Agreement, and the Engineer is willing to perform those services.

Therefore, in consideration of the premises and agreements contained here, the parties agree as follows:

Article I. Description of Project

A. Engineering design of Merrill Avenue Improvements. All for an estimated cost of \$22,805.00 ("Project"). Engineer will supply City with an estimated construction cost.

B. The term "estimated construction cost" is defined as the total estimated cost for the construction of the Project assigned to the Engineer under this Agreement for design, excluding fees or other costs for engineering, lands, and rights-of-way, and for legal and administrative procedures.

Article II. Engineer's Scope of Services

The Engineer shall perform professional engineering services relevant to the Project in accordance with the terms and conditions set forth here, and as provided in Exhibit I, which is attached to this agreement and by this reference made a part of it.

Article III. Changes in Scope

If changes occur either in the Engineer's Scope of Services or the Description of the Project, a supplemental agreement may be negotiated at the request of either party. For the purposes of such a change, the Engineer will supply to City an estimate of the cost for such change in services or project, and the amount paid for such change in services or project by City shall not exceed said estimate.

Article IV. Engineer's Fee

A. Basic Fee.

1. As compensation for Basic Services as described in Paragraph A of Exhibit I of this Agreement, and for services required in the fulfillment of Article II, the Engineer shall be paid a "Basic Fee," which shall constitute full and complete payment for those services and all expenditures that may be made and expenses incurred, except as otherwise expressly provided in this Agreement. The Basic Fee shall be the lump sum amount \$22,805.00.

2. The parties agree that the Basic Fee is based upon the Scope of Services to be provided by the Engineer and is not necessarily related to the estimated construction cost of the Project. In the event that the estimated construction cost differs from the estimated construction cost, the Engineer's compensation will not be adjusted unless the Scope of Services to be provided by the Engineer changes, and the adjustment is agreed to by the parties in writing pursuant to the provisions of Article III above.

B. Payment Schedule for Basic Fee.

The Basic Fee shall be paid in the following installments as the Engineer's work progresses:

1. A fee of \$4000 upon completion and acceptance by the City of the necessary work in the Final Design Phase. If the City terminates this Agreement after that completion and acceptance, no further fees shall be due the Engineer under Paragraph A of Article IV of this Agreement.

2. The fee of \$18,805 prorated in accordance with construction progress, except that five percent (5%) of the Basic Fee shall be payable only upon acceptance of the Project, and receipt of approved, reproducible mylar "Record Drawings" of the Project plans prepared in a format prescribed by the Public Works Director. .

C. Payment for Special Services.

As compensation for the services rendered by the Engineer as set forth in Paragraph B of Exhibit I of this Agreement entitled "Special Services," the City shall pay the Engineer such sums as may be agreed to by written amendment to this agreement. For such Special Services, Engineer agrees to furnish to City an estimate of cost for such special service. If the City agrees to have Engineer perform that service, Engineer agrees that the amount charged shall not exceed such estimate. Any agreement for such special service shall be as a supplemental agreement pursuant to Article III above.

D. Certified Cost Records.

The Engineer shall furnish certified cost records for all billings pertaining to other than lump sum fees to substantiate all charges. For those purposes, the books of account of the Engineer shall be subject to audit by the City. The Engineer shall complete work and cost records for all billings on those forms and in that manner as will be satisfactory to the City.

E. Gross Receipts Tax.

To the fees and other payments payable under this agreement, the Engineer may add any applicable gross receipts tax.

Article V. Ownership of Plans and Documents: Records

A. The field notes, design notes, and logs of any wells drilled, as instruments of service, are and shall remain, the property of the Engineer, however, copies of such records shall be furnished to City upon its request. All drawings of the construction plans, including any "as built" drawings, shall be the property of City. The City agrees that Engineer shall retain any common law copyright and that the City will not allow copies to be reproduced in a manner inconsistent with said common law copyright. The City shall be furnished, at no additional cost, a disk of all design drawings, including any "as built" construction drawings, with one set of reproducible mylars of the original drawings of the work.

B. The City shall make copies, for the use of the Engineer, of all of its maps, records, laboratory tests, or other data pertinent to the work to be performed by the Engineer under this Agreement, and also make available any other maps, records, or other materials available to the City from any other public agency or body.

C. The Engineer shall furnish to the City, copies of all maps, records, field notes, and soil tests that were developed in the course of work for the City and for which compensation has been received by the Engineer.

Article VI. Contract Times

The Engineer's work will be completed and ready for final payment within 120 calendar days of the date in the Notice to Proceed. No work shall commence before the Notice to Proceed is issued. Furthermore, this Contract does not take effect and is not valid unless and until it is accepted and approved by the Arizona Department of Housing ("ADOH").

Article VII. Termination

A. This Agreement may be terminated by either party upon fifteen (15) days' prior written notice to the other party in the event of substantial failure by the other party to fulfill its obligations under this Agreement through no fault of the terminating party.

B. This Agreement may be terminated by the City for its convenience upon twenty (20) days' prior written notice to the Engineer.

C. In the event of termination, as provided in this Article, the Engineer shall be paid as compensation in full for services performed to the date of that termination, an amount calculated in accordance with Article IV of this Agreement. Such amount shall be paid by the City upon the Engineer's delivering or otherwise making available to the City, all data, drawings, specifications, reports, estimates, summaries, and that other information and materials as may have been accumulated by the Engineer in performing the services included in this Agreement, whether completed or in progress.

Article VIII. Assignment

This Agreement shall not be assignable except at the written consent of the parties, and if so assigned, shall be binding upon the successors and assigns of the parties.

Article IX. Conflict of Interest

This agreement is subject to the Conflict of Interest Laws of the State of Arizona. It is subject to the cancellation provisions of A.R.S. §38-511.

Article X. Indemnity

To the fullest extent permitted by law, the Engineer agrees to defend and indemnify the City and its officers, agents, and employees against any and all actions of any character brought because of any injury or damage sustained by any person, persons, or property resulting from any asserted negligent act, error, or omission of the Engineer or its agents or employees, in whole or in part. The indemnity required here shall not be limited by reason of the specification of any particular insurance coverage in this Agreement.

Article XI. Insurance

The Engineer agrees to procure and maintain at its expense until final payment by the City for services covered by this Agreement, insurance in the kinds and amounts provided below with insurance companies authorized to do business in the State of Arizona, covering all operations under this Agreement, whether performed by it or its agents. Before commencing the work, the Engineer shall furnish to the City a certificate or certificates in form satisfactory to the City, showing that it has complied with this paragraph. All certificates shall provide that the policy shall not be changed or cancelled until forty-five days' prior written notice shall have been given to the City. Kinds and amounts of insurance required are as follows:

Workmen's Compensation Insurance.

Workmen's Compensation Insurance for its employees in accordance with the provisions of the Workmen's Compensation Act of the State of Arizona.

Liability Insurance.

Professional liability insurance in an amount not less than \$1,000,000.per claim and aggregate and automobile liability insurance in an amount not less than \$1,000,000.00, for injuries to any one person and \$1,000,000.00 on account of any one accident and in an amount of not less than \$500,000.00 for property damage to protect the Engineer and its agents from claims that may arise from services rendered under this Agreement, whether those services are rendered by the Engineer or by any of its agents or by anyone employed by either.

Article XII. Discrimination Prohibited

In performing the services required under this agreement, the Engineer shall not discriminate against any person on the basis of race, color, religion, sex, national origin or ancestry, age, or physical handicap.

Article XIII. Administration of Agreement

The City Manager, or authorized representative, shall administer this Agreement for the City.

In Witness, the parties have executed this Agreement as of the day and year written first above.

The City of San Luis

James Davey and Associates

By:_____

By:_____

APPROVED AS TO FORM:

By:_____
City Attorney

Exhibit I. Duty of Engineer

The Engineer shall render professional engineering services as described below:

A. Basic Services.

1. Preliminary Design Phase.

a. Confer with the City to review its objectives and requirements, inspect the site of the work, review the available material assembled by the City, and discuss design criteria and scheduling.

b. Plan and make the necessary reconnaissance surveys and other field investigations, if any are required.

c. Prepare, preliminary plans, preliminary estimate of cost, and outline specifications.

(2) Preliminary engineering studies, preliminary plans, preliminary estimates of cost, and outline specifications, shall be submitted for review and comment by the City.

(3) The Engineer shall not proceed with further performance of Basic Services until receiving a written order to do so from the City.

2. Final Design Phase.

a. Confer with the City and other interested parties as required to review comments from the preliminary Design Phase submittal.

b. Prepare complete detailed working drawings and accompanying documents. All plans, specifications, documents, and layouts prepared by the Engineer shall conform to and comply with standard practice and design requirements of the City and applicable codes and ordinances. Drawings shall show existing utilities and their locations. Contract Documents shall indicate the sequence in which utilities are to be relocated, where applicable.

c. Prepare and submit a detailed Engineer's estimate of cost for the Project.

d. Detailed working drawings, specifications, and other Contract Documents to the City for review and comments.

e. Confer with the City and other interested parties or agencies as required to review comments from the preceding submission. Corrections and minor changes in the completed Contract Documents, which are required by the City, shall be made by the Engineer at no additional cost to the City.

f. After incorporation of comments, provide the City with the requested number of check sets of Contract Documents for the Project.

g. Upon final City approval of the contract documents and prior to the first Advertisement For Bids, provide the City with [the requested number of sets of the approved Contract Documents for the Project

3. The Construction Phase.

a. Assist the City in obtaining construction bids. Tabulate bids and furnish a recommendation regarding the award of the construction contract.

b. Upon award of the construction contract, provide the City with the requested number of sets of formal Contract Documents for the Project, including plans and specifications.

c. Assist the City in the execution of formal Contract Documents for the construction contract.

d. Furnish consultation and advice during construction of the work.

e. Make periodic inspections and observation of the work in progress and provide inspection reports.

f. Make periodic estimates and certificates of payment at intervals required by the specifications of the Project.

g. Prepare reproducible "as built" drawings to reflect construction as actually accomplished.

h.. Make final inspection and recommendation regarding acceptance of the work performed in the construction contract. In performing construction inspection and observation, it is expressly understood and agreed that the Engineer will exert all reasonable effort to insure compliance with requirements of the construction contract, but the Engineer does not guarantee the performance of the Contractor.

B. Special Services.

Only when directed in writing by the City, the Engineer shall furnish or acquire for the City requested professional and technical services not covered by the Basic Services.

C. Performance.

1. The Engineer agrees that, immediately upon the execution of this Agreement, it will enter upon the duties prescribed in this agreement, proceed with the work continuously, and make the various submittals on or before the schedule specified here. The City is

not liable and will not pay the Engineer for any services rendered before written authorization is received by the Engineer.

2. The Engineer shall submit:

a. Preliminary engineering studies and field investigations as may be required;

b. Preliminary plans, outline specifications, and preliminary estimate of costs.

c. Final Design Phase plans, specifications, estimate of cost, and bid proposal documents for review.

d. Final construction contract documents ready for bid.

e. "As built" drawings after satisfactory completion of the Project.

3. If any delay is caused to the Engineer by order of the City to change the design or plans; or by failure of the City to designate right-of-way, or to supply or cause to be supplied any data not otherwise available to the Engineer that is required in performing the work described; or by other delays due to causes entirely beyond the control of the Engineer; then, in that event, the time schedules will be adjusted equitably in writing, as mutually agreed between the City and the Engineer at the moment a cause for delay occurs.

4. Since the work of the Engineer must be coordinated with the activities of the City, the Engineer shall advise the City in advance, of all meetings and conferences between the Engineer and any governmental agency, political subdivision, or third party which is necessary to the performance of the work of the Engineer.



AGENDA ITEM REVIEW FORM

City Council Work Session

3. A.

Meeting Date: 10/21/2015

Department Head: Jenny Torres, Community Development Director, Community Development Department

Submitted By: Dania Castillo, Economic Development Assistant, Community Development Department

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding update on the proposed recreation sports complex. **(Jenny Torres, Community Development Director)**

SUMMARY:

Yuma Union High School District is interested in partnering with the City of San Luis to allow the use of the High School fields for community recreation. Currently, the district is evaluating and prioritizing the bond projects with an expectation that the bond will be approved. If the bond is approved and they have a partner, the district is willing to prioritize the field improvements. The district is willing to allow the use of the fields, will make improvements and stub out all infrastructure in order for the city to pay and installed light fixtures for the field. The city would be required to maintain that field in exchange for its use. An Intergovernmental Agreement (IGA) would need to be developed and a plan of improvements would be made each year by both entities in order to improve the sports complex area. The proposed time frame would start construction in the fall of 2016.

RECOMMENDATION / SUGGESTED MOTION:

Discussion only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information is attached to this Agenda Item Review Form.

Document to be Recorded?: No

N/A

Fiscal Impact

| | |
|--|---|
| IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: | 0 |
| CITY/STATE/FEDERAL FUNDS: | 0 |
| TOTAL: | 0 |
| BUDGETED: | 0 |
| AVAILABLE TO TRANSFER: | 0 |
| ACCOUNT #/REMAINING BALANCE: | 0 |

FISCAL IMPACT STATEMENT:

N/A

Attachments

Map



Location Map

 AREA OF INTEREST

Date:
6/24/2015

Checked By:



Prepared By:
IG

Revised :

Case No.:



AGENDA ITEM REVIEW FORM

City Council Work Session

3. B.

Meeting Date: 10/21/2015

Department Head: Jenny Torres, Community Development Director, Community Development Department

Submitted By: Dania Castillo, Economic Development Assistant, Community Development Department

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding traffic studies and roadway needs for the Gadsden Elementary Schools Access Roads. (**Jenny Torres, Community Development Director**)

SUMMARY:

The City of San Luis contracted with Core Engineer to conduct two traffic impact studies and traffic signal needs assessments. The first study analyzes alternative access scenarios for 1st Street and 4th Avenue to be considered for the site of three Gadsden Elementary School District schools: Arizona Desert, San Luis Middle School and Rio Colorado Elementary School. This study defines permanent access on a parcel of State Trust Land east of the site that has been improperly used as access to the sites. The second traffic study was performed for the intersection of 10th Avenue and Juan Sanchez Boulevard. The site is the primary access to two Gadsden Elementary School District Schools, Harvest Preparatory Academy, charter elementary school and two residential subdivisions. The study was conducted in part by the ongoing consolidation and proposed expansion of Harvest Prep. City staff and school district staff met to discuss the above traffic studies and are working in defining the best solutions for both sites.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information is attached to this Agenda Item Review Form.

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: N/A

CITY/STATE/FEDERAL FUNDS: 0

TOTAL: 0

BUDGETED: 0

AVAILABLE TO TRANSFER: 0

ACCOUNT #/REMAINING BALANCE: 0

FISCAL IMPACT STATEMENT:

N/A

Attachments

Gadsden Offices TIA-Final Complete

10th Avenue & JS

Gadsden Elementary School District Access Roads 10/21/2015



Gadsden School District Schools

Traffic Impact Analysis and
Traffic Signal Needs Assessment

San Luis, Arizona

September 2015
CivTech Project No. 15-860

Prepared For:

Core Engineering Group, PLLC
200 East 16th Street, Suite 150
Yuma, Arizona 85364

For Submittal to:

City of San Luis

Prepared By:



10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

GADSDEN SCHOOL DISTRICT SCHOOLS TRAFFIC IMPACT ANALYSIS AND TRAFFIC SIGNAL NEEDS ASSESSMENT

San Luis, Arizona

Prepared for:

Core Engineering Group, PLLC
200 East 16th Street, Suite 150
Yuma, Arizona 85364

For Submittal to:
City of San Luis

Prepared By:



CivTech, Inc.
10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
(480) 659-4250



Prepared: September 2015
CivTech Project No. 15-860

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EXECUTIVE SUMMARY

This report documents a traffic impact study and a traffic signal needs assessment performed to analyze alternative access scenarios being considered for the site of three Gadsden Elementary School District schools: two elementary schools (Arizona Desert and Rio Colorado) and the San Luis Middle School. This study was prompted by the need for the District to define permanent (i.e., paved) access on a parcel of State Trust Land east of the site that has been improperly used as for access to the site. At present, the only paved access is from US 95 on the west side of the site while most trips to/from the site are via two unpaved accesses across the State Trust Land. In the absence of any TIA guidelines having been formally adopted by the City of San Luis, CivTech prepared this study in conformance with the City of Yuma's traffic impact study guidelines as outlined in Yuma Standard No. 2-100 and detailed in separate *Traffic Impact Study Guidelines* dated September 20, 2006. These guidelines recommend that text be kept to a minimum.

Three options are considered herein: **Option A**, the 1st Street option, is paving southerly from the southeast corner of the site to intersect Juan Sanchez Boulevard opposite 1st Street. **Option B**, the Union Street/4th Avenue option, is paving easterly from the southeast corner of the site to intersect 4th Avenue across from Union Street while the school children and other pedestrians would continue to cross at the existing crosswalk at 1st Street, which would be upgraded to a new pedestrian hybrid beacon (PHB) or rectangular rapid flashing beacon (RRFB), and site-generated vehicular traffic would be directed east to 4th Avenue at Union Street to Juan Sanchez Boulevard, at which it is recommended a traffic signal be installed. **Option C** would provide the two paved accesses described above with the access at 1st Street at Juan Sanchez Boulevard having a westbound right turn lane and movements restricted to right-in/right-out only; the schoolchildren and other pedestrians would continue to cross at 1st Street and some vehicular traffic will be directed east to 4th Avenue at Union Street, which would be converted to an all-way stop or a traffic signal.

The following conclusions and recommendations are documented in this study:

- ◆ The AM and PM peak hour intersection level of service analyses for the existing conditions and the conditions expected under each option revealed the following on an intersection-by-intersection basis:
 - 4th Avenue & Union Street – The analyses revealed that implementation of Option A and the closure of the de facto west leg of the intersection, should improve existing good levels of service to better levels of service north- and southbound. Bringing traffic across from the schools to 4th Avenue under Option B or C increases the inbound trips in the morning, specifically the site-bound, northbound left turns, which is expected to cause average delays of 43.7 seconds (nearly $\frac{3}{4}$ of a minute) for the northbound movement. While such delays are considered LOS E at the unsignalized intersection, as noted above, similar waits would be LOS D if this were a signalized intersection. Under Option C, in which some of the trips would not be redirected from 1st Street,

- the inbound volumes are lower in the morning than with Option B and no movements operate at poor or unacceptable levels of service
- 4th Avenue & Arizona Street – The analyses revealed that this intersection would be little affected by either option. All movements would continue to operate at LOS C or better under any of the options.
 - 4th Avenue & Juan Sanchez Boulevard – The analyses revealed that, under Option A, without installation of a traffic signal (or conversion to an all-way stop, which would spread the delays around), the north- and southbound movements are expected to operate at poor to failing levels of service. With the installation of a traffic signal, as is assumed under Options B and C, it is expected that the all movements approaching the intersection would operate at not less than LOS C or with an average delay of more than 35 seconds.
 - 1st Street & Juan Sanchez Boulevard – Under Option A, with the intersection remaining as-is and only the existing 4th Avenue traffic redirected to 1st Street, there is little change from the existing condition with east- and westbound Juan Sanchez Boulevard operating at similar levels of service with delays of similar magnitude and a law enforcement officer still required each school day. Under Option B, the existing southbound approach would be effectively closed, the existing crosswalk would be left in place and converted to a PHB or RRFB (the effect of which, unfortunately, cannot be analyzed using HCM 2010 methods), and, with removal of the stop signs on Juan Sanchez Boulevard, the intersection would be converted from an all-way to a one-way stop (northbound approach only). The analyses revealed that the levels of service should be improved on Juan Sanchez Boulevard during the AM peak hour and should operate at about the same LOS during the PM peak hour and the stop-controlled northbound approach would operate at LOS D. Under Option C, with all-way stop control, both accesses paved, a new westbound right turn lane into 1st Street, and the conversion of the pedestrian crossing to a PHB or RRFB, the only average delays expected to operate at poor levels of service are the east- and westbound through movements during the PM peak hour. The eastbound through movement is expected to operate at LOS F with an average delay of 62.0 seconds, just over a minute. The westbound through movement is expected to operate at LOS E with an average delay of 37.3 seconds, less than $\frac{2}{3}$ of a minute. The eastbound delay of 62.0 seconds would be considered a “high” LOS E at a signalized intersection (55 seconds is the break point between LOS D and LOS E) and the westbound delay of 37.3 seconds would be a high LOS D at a signalized intersection (35 seconds is the break point between LOS C and LOS D).
 - *Analysis:* Based on the levels of service and V/C ratios on the intersection approaches, Option C, consisting of two paved accesses with access restricted to right-in/right-out only at 1st Street, a westbound right turn lane approaching 1st Street, the existing pedestrian crossing upgraded to a PHB or RRFB, and a traffic signal installed at 4th Avenue and Juan Sanchez Boulevard, offers the best comprehensive approach without having to construct capacity improvements (additional lanes, etc.) at any of the intersections.

- ◆ To summarize the traffic signal needs assessment, a traffic signal at the intersection of 4th Avenue and Juan Sanchez Boulevard may currently be warranted. However, it must be cautioned that satisfying a warrant does not dictate that a traffic signal must be installed. If the City determines that the anticipated delays at the intersection in an all-way stop condition are acceptable for the foreseeable future, then a signal does not have to be provided. This may be part of a “wait-and-see” approach to see if the predicted delays actually occur. With the existing all-way stop at 1st Street, traffic may be metered such that the anticipated delays do not materialize.
- ◆ The heavy pedestrian volumes at 1st Street revealed that pedestrians do not require sidewalks; however, separate facilities for motorized and non-motorized travel are desirable if such can be provided. The following is a summary of areas where sidewalk is not currently provided along the routes to the schools:
 - 1st Street – east and west sides, Juan Sanchez Boulevard south to E Street
 - 4th Avenue – west side, Juan Sanchez Boulevard south to E Street
 - 4th Avenue – east side, Juan Sanchez Boulevard south to south of E Street
 - 4th Avenue – east side, Juan Sanchez Boulevard north to Arizona Street
 - 4th Avenue – west side, Juan Sanchez Boulevard north to Union Street
 - Juan Sanchez Boulevard – north and south sides, 1st Street to 4th Avenue
- ◆ CivTech recommends Option C as the preferred alternative. Under Option C, with two paved accesses and the access to Juan Sanchez Boulevard at 1st Street restricted to right-in/right-out movements only, some portion of the vehicular trips will be directed from the school site to the east to 4th Avenue and the majority of the schoolchildren will be allowed to cross at 1st Street as they currently do. The operation of the existing crosswalk would be enhanced by upgrading to a PHB or RRFB crossing and a school crossing guard could be used instead of a law enforcement officer as is now needed. The operation of the intersection of 4th Avenue and Juan Sanchez Boulevard would also be enhanced by the installation of a traffic signal, warrants for which are already satisfied by existing traffic volumes.

INTRODUCTION

The Arizona State Land Department is allowing the City of San Luis and/or the Gadsden Elementary School District to define the extent of permanent, paved access across State Trust Land located immediately east of the site of three schools. The schools are located east of US 95/Main Street and north of Joe Orduño Memorial Park and the San Luis Recreation Center. New vehicular access will be constructed on the State Trust Land to replace two unpaved paths. At present, the only paved access is from US 95 on the west side of the site and most trips to/from the site are via unpaved accesses on the east side of the site. **Figure 1** is a vicinity map showing the study area.

PURPOSE OF REPORT AND STUDY OBJECTIVES

CivTech Inc. was retained by Core Engineering Group of Yuma to prepare this Traffic Impact Analysis and Traffic Signal Needs Assessment (TIA).

The purpose of this report is to assist Core in identifying in terms of traffic impacts appropriate routing for the new access by analyzing the impacts on the existing roadway network of two potential routes that would follow either or both of two existing unpaved paths now in use: one that would extend easterly across a parcel of undeveloped State Trust Land to 4th Avenue and a second route that would extend southerly, intersecting Juan Sanchez Boulevard across from 1st Avenue. In the absence of any TIA guidelines having been formally adopted by the City of San Luis, CivTech prepared this study in conformance with the City of Yuma's traffic impact study guidelines as outlined in Yuma Standard No. 2-100 and detailed in separate *Traffic Impact Study Guidelines* dated September 20, 2006. These guidelines recommend that text be kept to a minimum. The specific objectives of the study are:

- ◆ To determine the effect of each of the potential alternatives being considered to provide the necessary access; and
- ◆ Assess the need for a traffic control signal at either 1st Avenue or 4th Avenue and Juan Sanchez Boulevard, dependent on the result of the alternatives analysis.

An unsealed draft of this document was reviewed by City staff. CivTech received comments (see **Appendix A**) and revised this final version accordingly. Formal responses to the City comments were not prepared.

Study Area

The scope of the study includes the following intersections:

- ◆ 4th Avenue and Union Street
- ◆ 4th Avenue and Arizona Street
- ◆ 4th Avenue and Juan Sanchez Boulevard
- ◆ 1st Street and Juan Sanchez Boulevard
- ◆ US 95/Main Street and Main Access (site traffic only considered)

Analysis Years

This study will analyze two alternate routes briefly described above using the existing volumes and a third option which allows the majority of school children to continue to cross at 1st Street. The new vehicular access is expected to be paved later in 2015 or in early 2016.

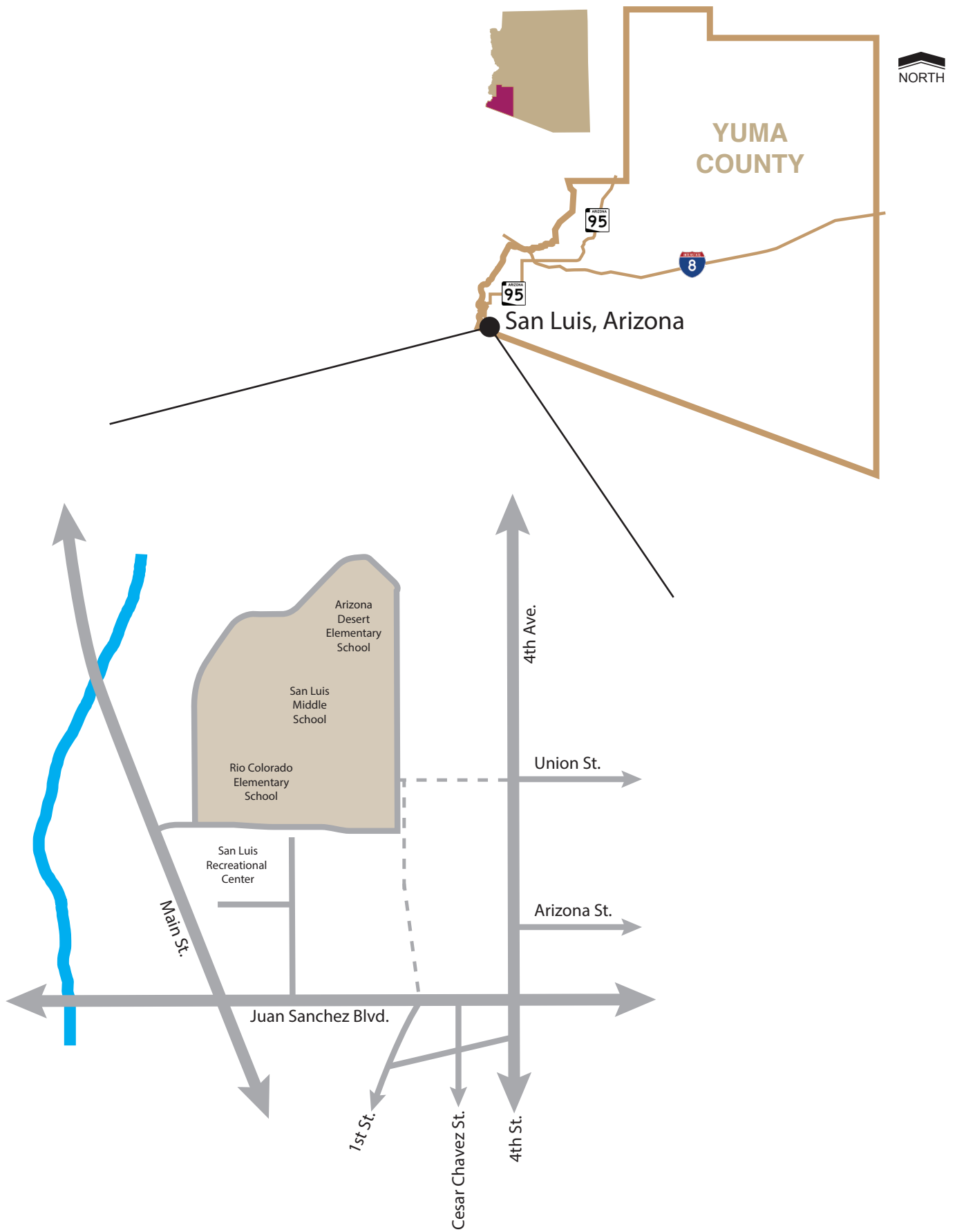


Figure 1: Vicinity Map

EXISTING CONDITIONS

The study area consists of four intersections plus an existing driveway that are located around the site of three Gadsden Elementary School District schools: two elementary schools (Arizona Desert and Rio Colorado) and the San Luis Middle School. Joe Orduño Memorial Park, in which is located the San Luis Recreation Center, is to the south of the site. The De Santiago Auto Center is to the west, between the schools and US 95/Main Street. There is a vacant parcel of State Trust Land to the east and the Main Canal runs generally southwest-northeast separating the auto center and the schools from a residential neighborhood.

Regarding the State Trust Land, CivTech understands that there is no right of access for anyone to traverse the parcel; yet, over time vehicles have worn two existing paths, both from the southeast corner of the schools complex, one to the south toward 1st Street and one to the east toward Union Street, into the surface. The Arizona State Land Department is allowing the City and/or District to define the extent of the access required so that the necessary land can be provided.

Due to the heavy use of these unofficial roadways, the City of San Luis must provide a law enforcement officer every school day morning and afternoon at the intersection 1st Street at Juan Sanchez Boulevard at considerable expense to the City. Trained officers are required because they direct traffic, which a school crossing guard is not permitted to do. The officer is used due to concerns over eastbound Juan Sanchez Boulevard traffic backing up to Main Street/US 95.

ROADWAY NETWORK AND INTERSECTION CONFIGURATION

4th Avenue is a north-south roadway that begins ½ mile south of Juan Sanchez Boulevard at Urtuzuastegui (or “U”) Street and extends nearly 1½ miles north to County 22nd Street. North of Juan Sanchez Boulevard, it is striped to provide one lane in each direction. with a continuous two-way left turn lane to and then narrows to two lanes and serves as a minor collector roadway with no direct accesses from adjacent properties. South of Juan Sanchez Boulevard, 4th Avenue is not striped and serves as a local residential street. Beginning south of E Street it widens and has curb and gutter and sidewalk.

1st Street is a north-south roadway that begins at the US/Mexico border crossing south of at U Street and extends north through non-residential areas to Juan Sanchez Boulevard, it is striped to provide one lane in each direction its entire length. Beginning at E Street, it widens and has curb and gutter and sidewalk to the south. 1st Street and 4th Avenue are approximately 550 feet apart.

Juan Sanchez is an east-west roadway within the City of San Luis that was abandoned by the Arizona Department of Transportation (ADOT) to the City. The section of Juan Sanchez Boulevard within the City limits was at one time designated State Route 195 (SR 195), which was constructed as a bypass or an alternative for US 95 from the US-Mexico border to Yuma. SR 195 begins approximately four and one-half miles east of 4th Avenue on Juan Sanchez Boulevard. Beginning east of 4th Avenue, on the westbound approach to 4th Avenue, and continuing to west of US 95/Main Street, Juan Sanchez Boulevard has a posted speed limit of 25 mph and consists of one through lane in each direction separated by a continuous two-way left-turn lane.

(1) The intersection of **4th Avenue and Union Street** is a 4-legged, all-way stop-controlled (AWSC) intersection. All approaches provide a single shared lane. The eastbound approach is unpaved.

(2) The intersection of **4th Avenue and Arizona Street** is a 3-legged, one-way stop-controlled “Tee” intersection with stop control on the westbound approach. All approaches provide a single shared lane. Although unpaved and barricaded, there were a few vehicles recorded as approaching from the west; these vehicles will be re-routed in the alternatives analysis.

(3) The intersection of **4th Avenue and Juan Sanchez Boulevard** is a 4-legged, two-way stop-controlled (TWSC) intersection. The intersection is configured thus:

- Northbound: stop-controlled, 1 shared lane;
- Southbound: stop-controlled, 1 shared through/left-turn lane; 1 right turn pocket (40');
- Eastbound: 1 left-turn lane (100'), 1 shared through/right-turn lane; and
- Westbound: 1 left-turn lane (75'), 1 through lane, 1 right-turn lane (75').

(4) The intersection of **1st Street and Juan Sanchez Boulevard** is a 4-legged, all-way stop-controlled (AWSC) intersection. Crosswalks are marked on the west side of 1st Street and across 1st Street south of Juan Sanchez Boulevard. One of the reasons for the all-way stop is that this is a major pedestrian crossing for students of the three schools. The crossing also serves Joe Orduño Park. The intersection is configured thus:






- Northbound: 1 shared lane;
- Southbound: unpaved, 1 shared lane;
- Eastbound: 1 left-turn lane (90'), 1 shared through/right-turn lane; and
- Westbound: 1 left-turn lane (85'), 1 shared through/right-turn lane.

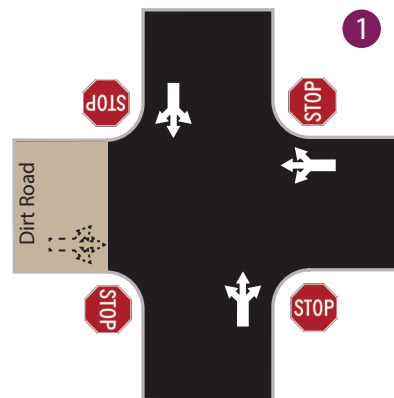
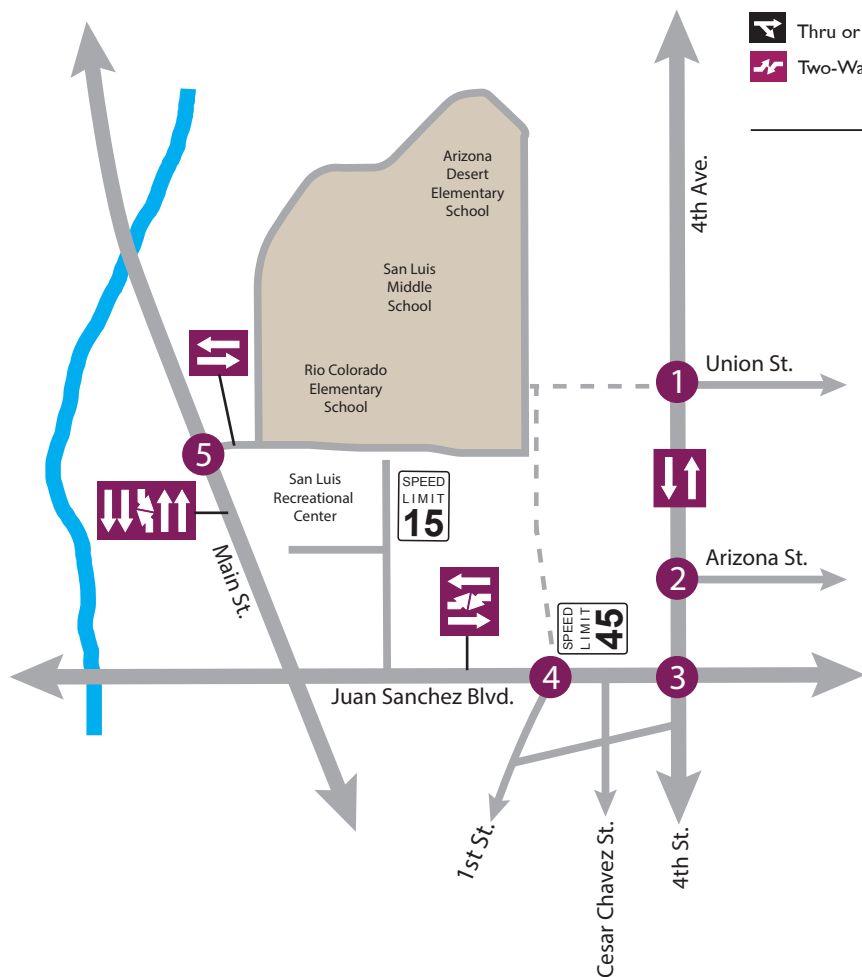
(5) The intersection of **US 95/Main Street and the Main Access** of the site is of interest in this study only as a source of trips that could be redirected to a second access once paved. Only the turns in and out of this driveway were recorded. It is assumed that some of the vehicles approaching from or destined to the south are those of drivers who prefer not to regularly travel on an unpaved surface; thus, when a second, paved access is available, these drivers will alter their regular routes to take advantage of the new access. This intersection is, therefore, not included in the subsequent analysis, but is shown in figures so that the re-distribution of its turns can be tracked.

The existing lane configurations and traffic controls are illustrated in **Figure 2**. Photographs of existing conditions can be found **Appendix B**.

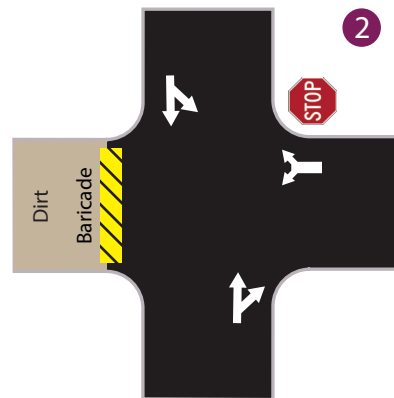
ADOT US 95 San Luis Street Improvements Project. A ribbon-cutting ceremony was scheduled for July 8, 2015 for ADOT's US 95 San Luis Street Improvements project that was completed on June 22. Briefly, south of Juan Sanchez Boulevard, US 95 has now been rerouted from Main Street onto Archibald Street as one-way southbound from D Street to U Street. The paired one-way northbound roadway is 1st Street from U-Street to D Street. All through traffic entering Arizona via the San Luis Port of Entry is directed north via 1st Street to D Street westbound and back onto Main Street/US 95 via a bypass lane at a newly-constructed roundabout. Local traffic will continue to use 1st Street, which remains two-way north of D Street.

LEGEND

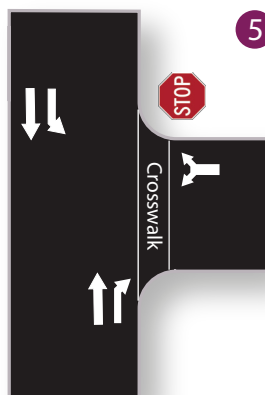
-  Thru or Turning Movement
-  Two-Way Left Turn-Lane
-  Traffic Signal
-  Stop Sign
-  Speed Limit



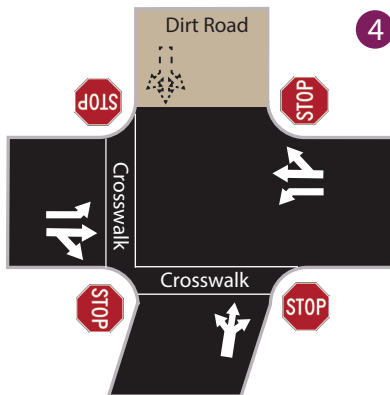
4th Avenue & Union Street



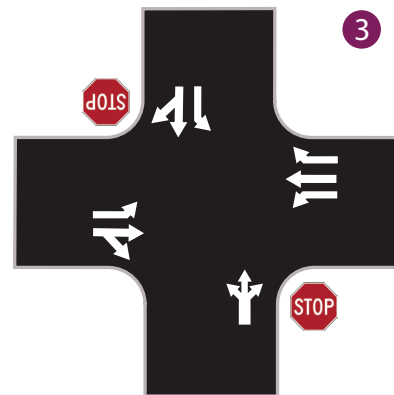
4th Avenue & Arizona Street



Main Street & Main Access



1st Avenue & Juan Sanchez Boulevard



4th Ave/4th St & Juan Sanchez Boulevard

Figure 2: Existing Lane Configurations and Traffic Controls

TRAFFIC VOLUMES

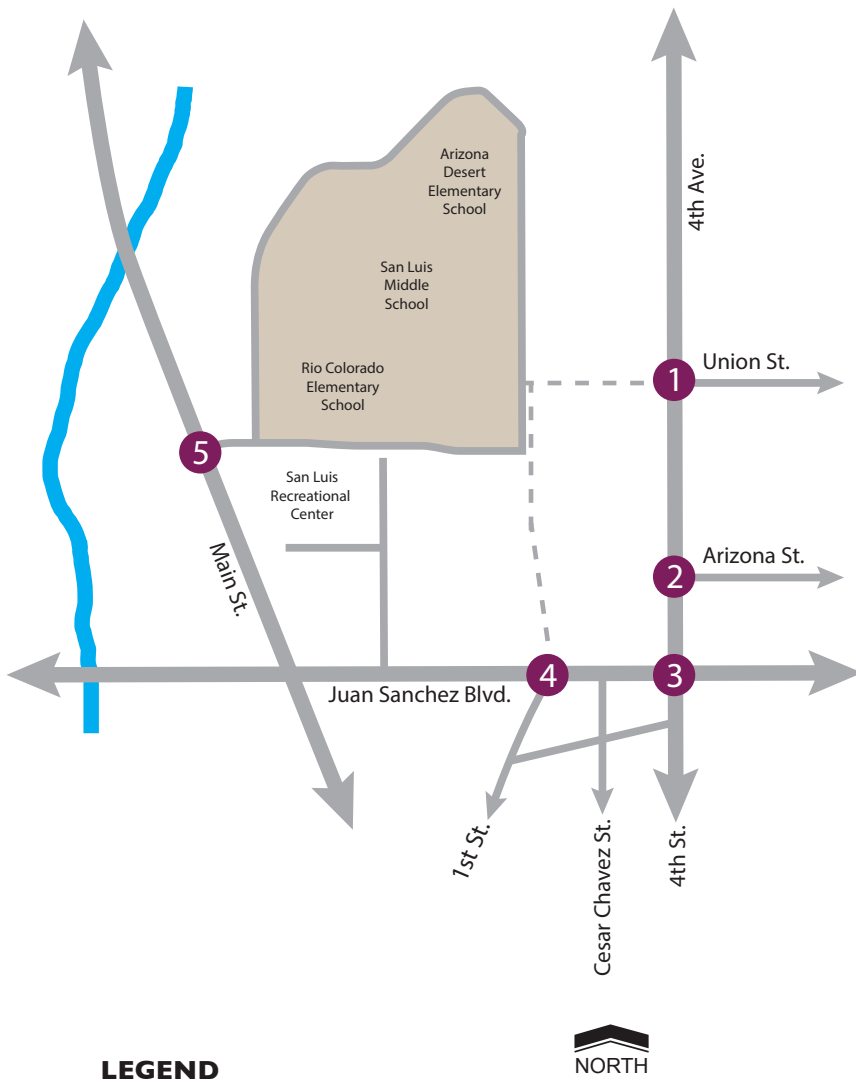
Core Engineering Group conducted AM and school PM peak hour turning movement counts at the five intersections on a day when the schools were in session, Tuesday, May 12, 2015, and Thursday, May 14, 2015 from 6:30 AM to 8:30 AM and 2:30 PM to 4:30 PM. **Figure 3** depicts the recorded AM and school PM peak hour turning movement volumes. The sheets on which the volumes were reported are provided in **Appendix B**. It is not known how the ADOT construction project, which was nearing completion in May, may have affected traffic patterns at that time, if at all.

Seasonal Adjustment Factor. Please note that, since the area attracts a substantial number of visitors and seasonal agricultural workers during the winter months and the traffic counts were conducted during the late spring while school, as noted, was still in session. By May, most winter visitors have typically returned to their permanent homes and agricultural production may yet be in full operation or nearly so; thus, in the analysis it may be prudent to consider the application of some level of adjustment to the recorded volumes. This is addressed here.

CivTech reviewed historical traffic volume data available from the Yuma Metropolitan Planning Organization (YMPO) to estimate an appropriate adjustment factor to be applied to the existing traffic counts in order to have the capacity analysis better approximate conditions in the busier winter months. YMPO records traffic counts twice each year: in February and the following July. CivTech reviewed recent historical vehicular traffic volumes on Juan Sanchez Boulevard east of US 95/Main Street. A summary of the data compiled is found at the end of **Appendix B**.

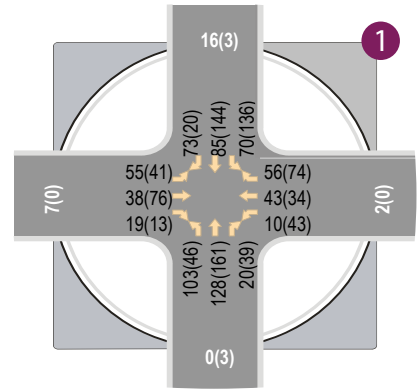
YMPO includes the San Luis area in its "South Valley Subarea". The data shows that the traffic volumes recorded in the South Valley Subarea increased about six and one-half percent per year from 2011 to 2012 and from 2013 to 2014 with only a minor increase (about one-half percent) from 2012 to 2013. However, on Juan Sanchez Boulevard there was actually a drop of more than eight percent from 2012 to 2013 before a rebound of about one-third from 2013 to 2014.

The summer-to-winter variations for the subarea averaged 29.31% in 2012, 19.24% in 2013, and 30.02% in 2014. For Juan Sanchez Boulevard, the average changes were 22.84% in 2012, 34.15 % in 2013, and 29.49% in 2014. The overall average variation on Juan Sanchez Boulevard for the three years was 28.65%. As noted, this overall variation was calculated using February and July data and the counts were recorded in May when most winter visitors have left, some agricultural workers may remain, and many local residents have not left for vacations (since schools are still in session). Therefore, a reduced factor of 20% to account for the seasonal variation between the busy winter season and the late spring counts will be applied to the through volumes on Juan Sanchez Boulevard.

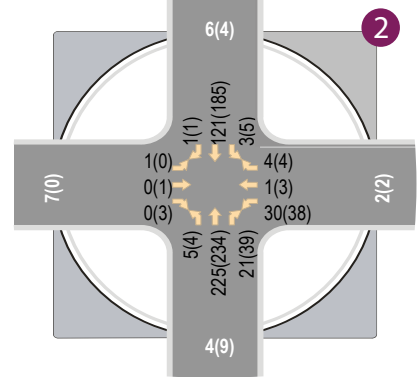


LEGEND

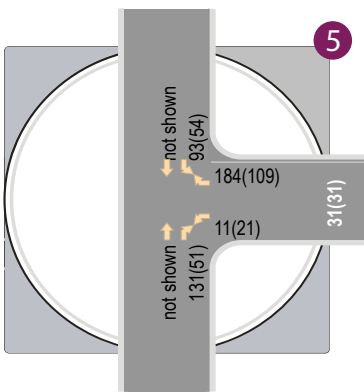
- XX(XX) - AM(PM) Peak Hour Traffic Volumes
- XX(XX) - AM(PM) Peak Hour Pedestrian Counts



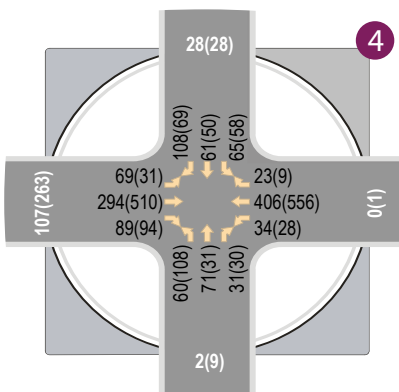
4th Avenue & Union Street



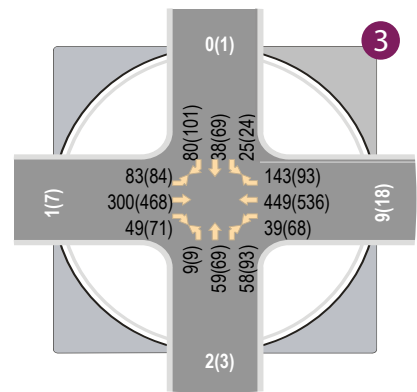
4th Avenue & Arizona Street



Main Street & Main Access



1st Avenue & Juan Sanchez Boulevard



4th Ave/4th St & Juan Sanchez Boulevard

Figure 3: Existing Traffic Volumes

PROPOSED ALTERNATIVES

This study was prompted by the need for the City of San Luis and/or the Gadsden Elementary School District to define the extent of permanent access to the site of three Gadsden Elementary School District schools collocated on a site with a single paved access. Except during inclement weather, in which there could be some minor ponding of storm water on the adjacent undeveloped parcel of State Trust Land to the east, the majority of the vehicular trips and a sizable percentage of the pedestrian trips generated by the schools' exit to the east and/or south via vehicular paths noticeable even in aerial photography.

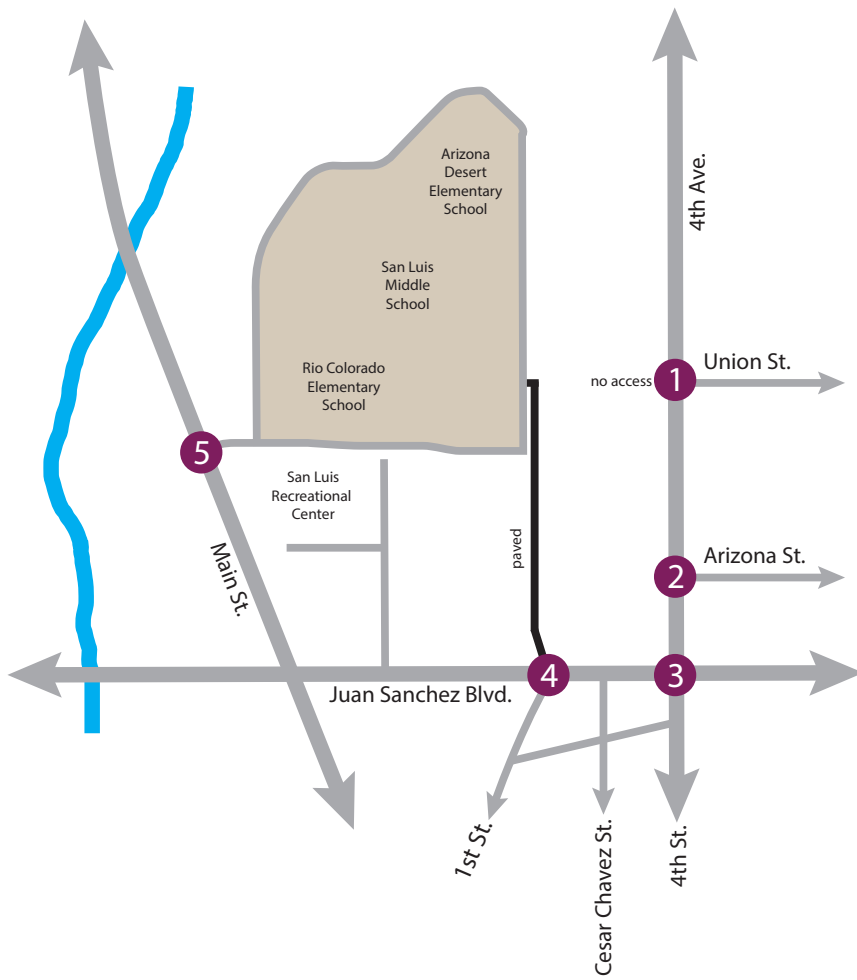
CivTech understands that one or both of two possible vehicular routes were being considered, yielding three options. If, as a result of the analysis herein, a single route is preferred, it is expected that measures would be taken to prohibit the other movement, resulting in all of the vehicular trips recorded to be assigned to one or the other. In all cases, it is expected that some portion of the trips now made by drivers that do not prefer to regularly travel on an unpaved surface and, for that reason, now use the US 95/Main Street driveway, would be redirected to the preferred option. No option assumes additional capacity improvements to existing intersections.

OPTION A (1ST STREET OPTION)

Option A, the 1st Street option, is paving southerly from the southeast corner of the site to intersect Juan Sanchez Boulevard opposite 1st Street. Since this access could either remain as an all-way stop or be signalized, the pedestrian movements recorded in May remain unchanged at the study intersections. **Figure 4** shows the changes in vehicular trips and pedestrian movements as they would be redirected per Option A. **Figure 5** shows the revised trips and pedestrian movements, with a seasonal factor of 1.20 applied to the through traffic volumes on Juan Sanchez Boulevard to better simulate peak winter volumes.

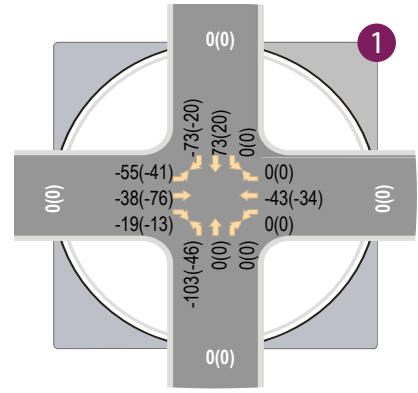
OPTION B (UNION STREET/4TH AVENUE OPTION)

Option B, the Union Street/4th Avenue option, is paving easterly from the southeast corner of the site to intersect 4th Avenue across from Union Street. Most of this traffic would be expected to then access Juan Sanchez Boulevard via 4th Avenue. Thus, the need for a signal at the intersection of 4th Avenue and Juan Sanchez Boulevard will be considered. The high pedestrian counts at 1st Street would likely render unsuccessful any attempt to redirect them from 1st Street to 4th Avenue; the new route would be more inconvenient for them, adding about 1,100 feet (nearly one-quarter mile) to the walk. To possibly eliminate the need for a law enforcement professional at the intersection each school day and allow, instead, a typical school crossing guard, the installation of some type of innovative intersection safety treatment will be required. One such treatment is a pedestrian hybrid beacon (PHB) as found in the *Manual on Uniform Traffic Control Devices*. Another is a Rectangular Rapid Flashing Beacon (RRFB), which is not only effective, but considerably less expensive to install and maintain than a PHB according to a short report included as **Appendix C.** Since either will stop traffic on Juan Sanchez Boulevard only when activated, potential long backups should not occur with any regularity. **Figure 6** shows the changes in vehicular trips and pedestrian movements as they would be redirected per Option B. **Figure 7** shows the revised vehicular trips with the seasonal factor applied to the through traffic volumes on Juan Sanchez Boulevard; the pedestrian movements are as shown in the existing conditions.

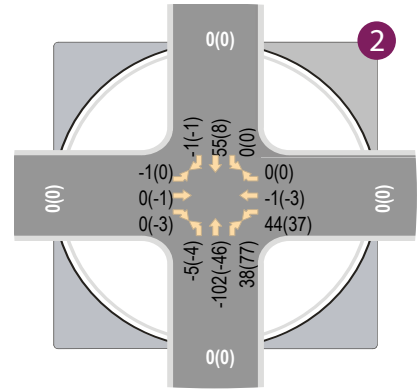


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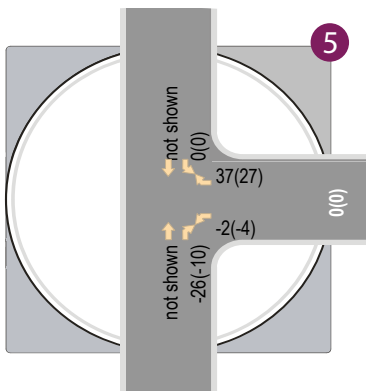
XX(X) - AM(PM) Peak Hour Traffic Volumes
 XX(X) - AM(PM) Peak Hour Pedestrian Counts



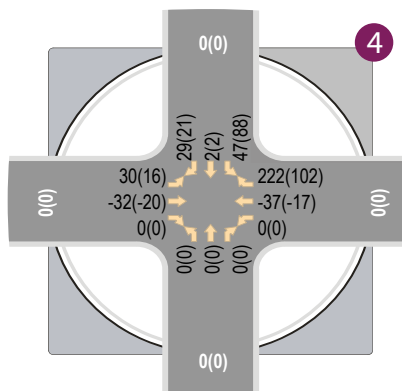
4th Avenue & Union Street



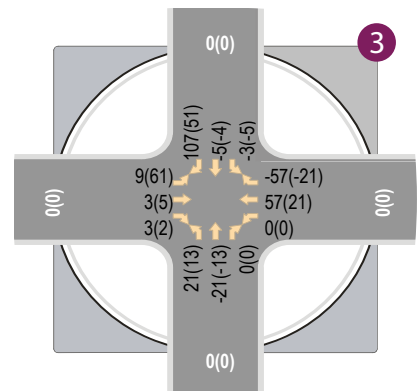
4th Avenue & Arizona Street



Main Street & Main Access

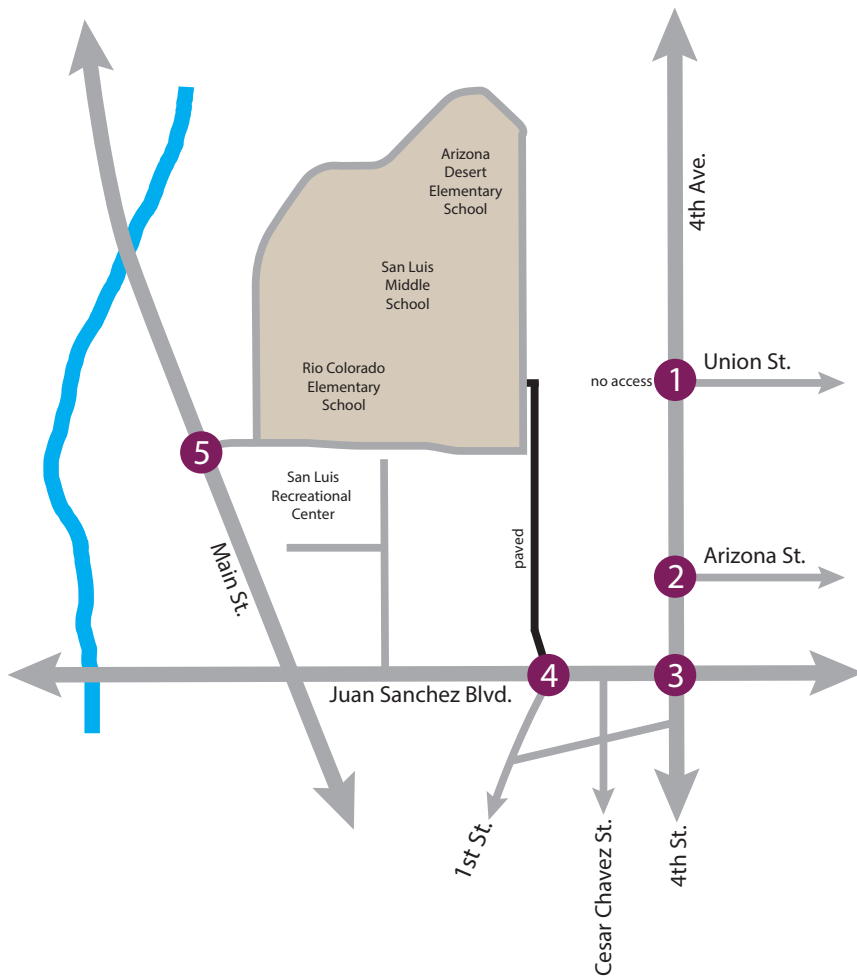


1st Avenue & Juan Sanchez Boulevard



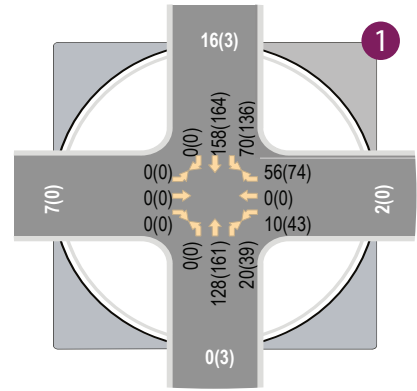
4th Ave/4th St & Juan Sanchez Boulevard

Figure 4: Option A Volume Changes

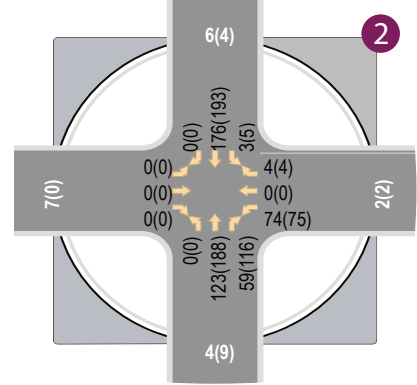


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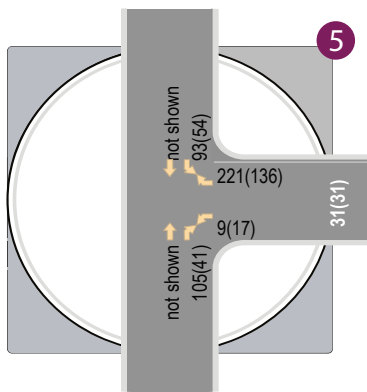
XX(XX) - AM(PM) Peak Hour Traffic Volumes
 XX(XX) - AM(PM) Peak Hour Pedestrian Counts



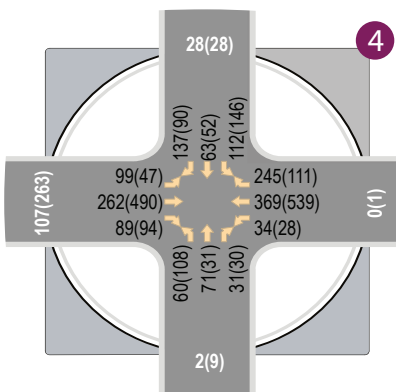
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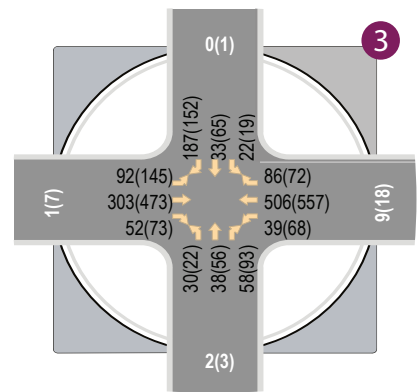
4th Avenue & Arizona Street



Main Street & Main Access

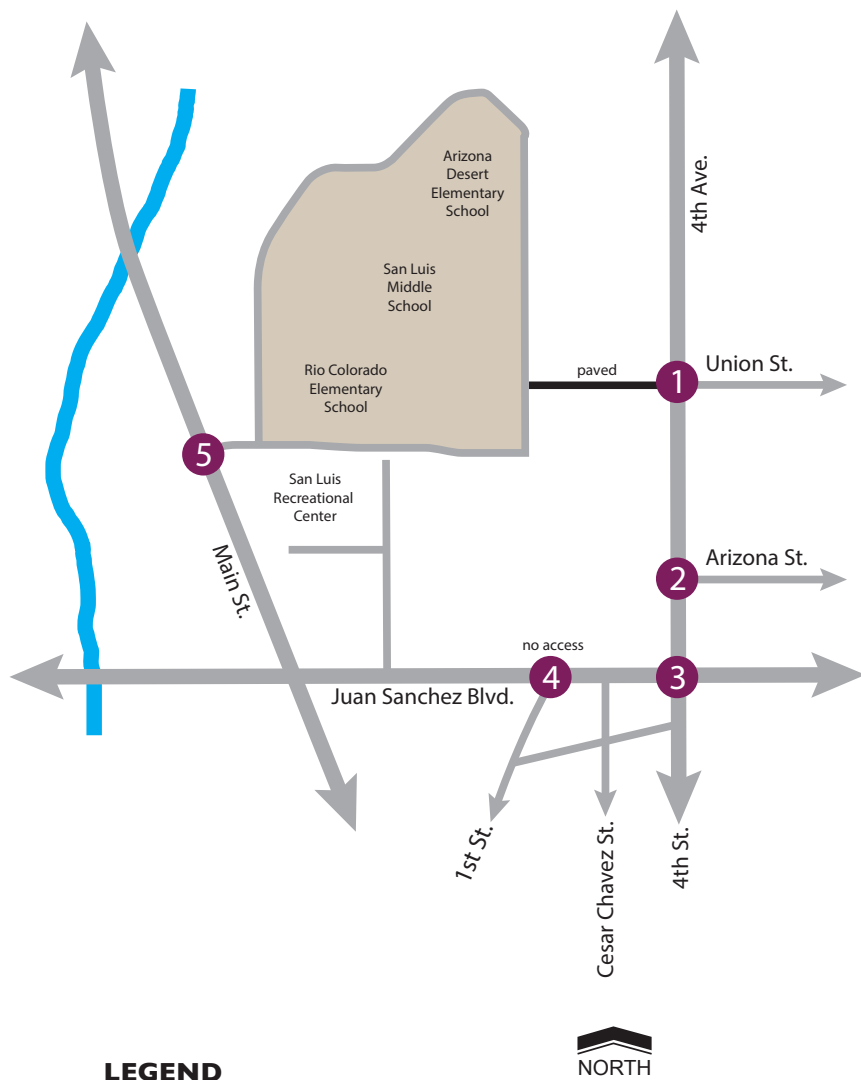


1st Avenue & Juan Sanchez Boulevard



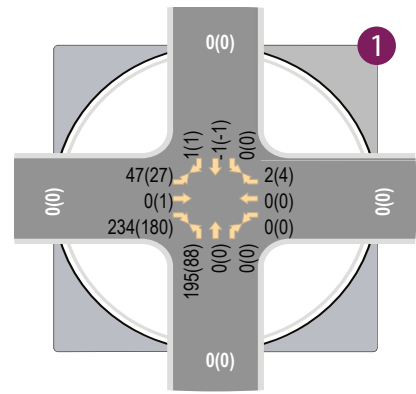
4th Ave/4th St & Juan Sanchez Boulevard

Figure 5: Option A Final Volumes

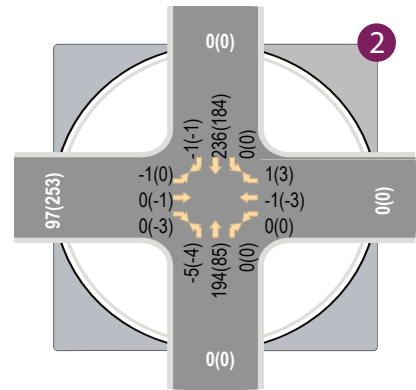


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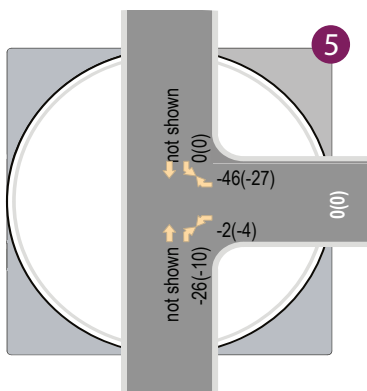
- XX(XX) - AM(PM) Peak Hour Traffic Volumes
- XX(XX) - AM(PM) Peak Hour Pedestrian Counts



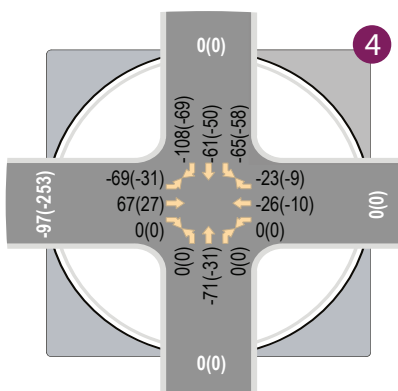
4th Avenue & Union Street



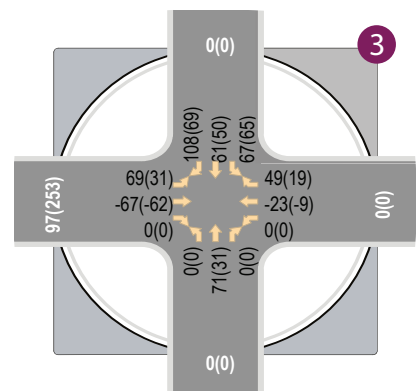
4th Avenue & Arizona Street



Main Street & Main Access

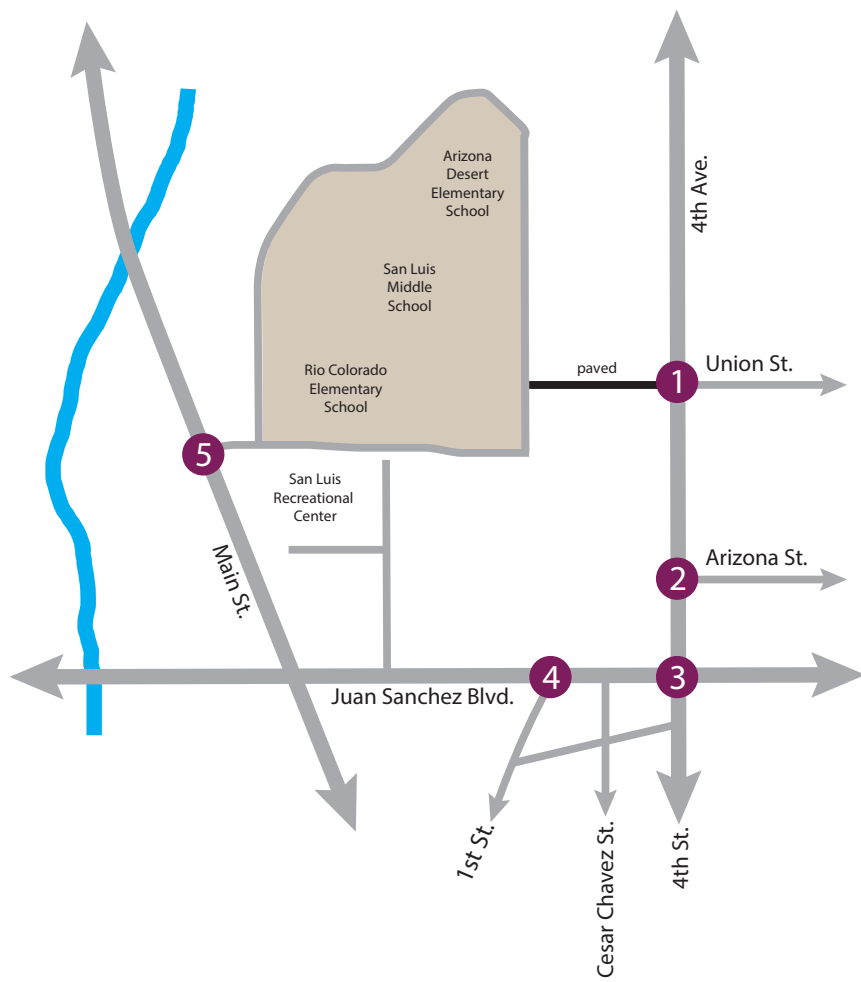


1st Avenue & Juan Sanchez Boulevard



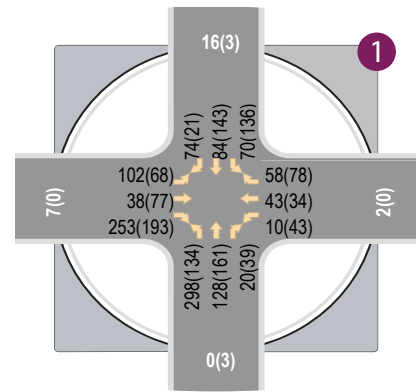
4th Ave/4th St & Juan Sanchez Boulevard

Figure 6: Option B Volume Changes

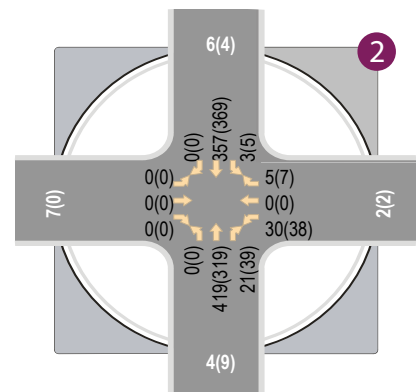


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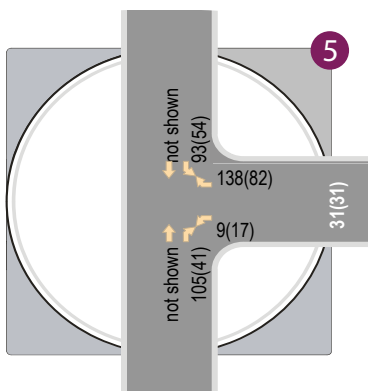
- XX(XX) - AM(PM) Peak Hour Traffic Volumes
- XX(XX) - AM(PM) Peak Hour Pedestrian Counts



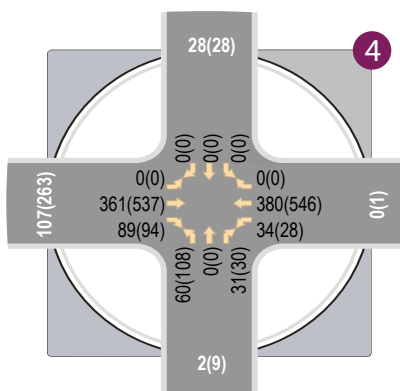
4th Avenue & Union Street



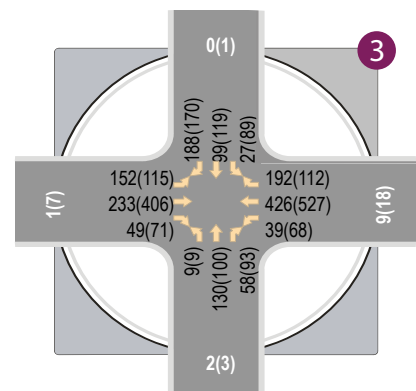
4th Avenue & Arizona Street



Main Street & Main Access



1st Avenue & Juan Sanchez Boulevard



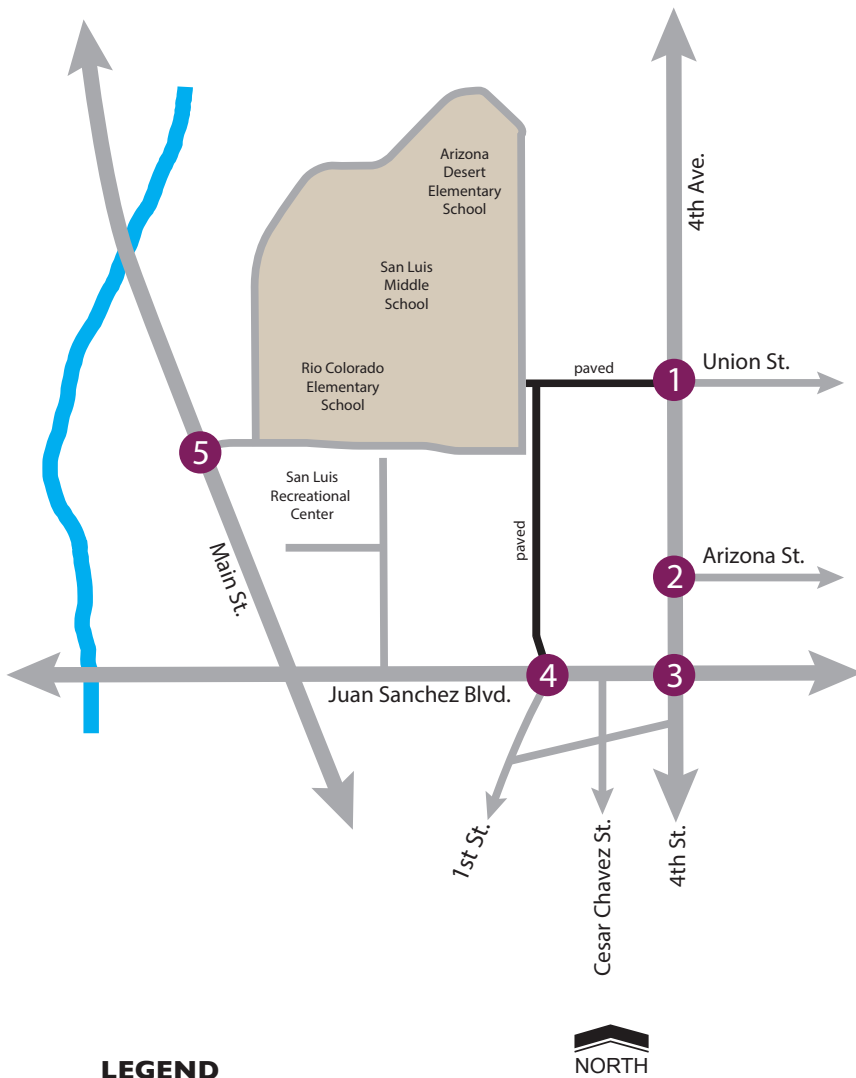
4th Ave/4th St & Juan Sanchez Boulevard

Figure 7: Option B Final Volumes

OPTION C

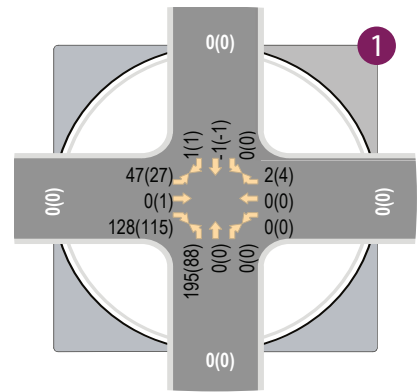
Option C is the third alternative considered herein. Since the pedestrian counts revealed that many more pedestrians cross Juan Sanchez Boulevard at 1st Street than they do at 4th Avenue, in Option C, it is expected that these pedestrians will continue to cross at 1st Street. In addition, both existing paths will be paved, providing two possible routes for vehicular traffic. However, unlike the current condition at 1st Street, movements will be restricted at the new 1st Street access to right-in/right-out movements only. **Figure 8** shows the changes in vehicular trips and pedestrian movements as they would be redirected per Option C, in which the existing left-in/left-out movements at 1st Street are redirected to 4th Avenue. **Figure 9** shows the revised vehicular trips with the seasonal factor applied to the through traffic volumes on Juan Sanchez Boulevard. Also included in Option C is a westbound right turn lane that would be constructed on Juan Sanchez Boulevard approaching 1st Street.

Please note that it is CivTech's understanding that the City intends to widen Juan Sanchez Boulevard to an arterial roadway cross-section. While such a project has not yet been scheduled, CivTech further understands that Juan Sanchez Boulevard would provide five lanes, two lanes in each direction with a continuous two-way left turn lane and exclusive left turn lanes at major intersections, from US 95/Main Street to 9th Avenue, where it would match the cross-section that has been already been completed to the east. Ideally, the proposed right turn lane would be designed and constructed to be consistent with the ultimate improvements to Juan Sanchez Boulevard, eventually becoming part of a new westbound through/right-turn lane. However, CivTech understands that there are other engineering issues that may require major reconstruction of Juan Sanchez Boulevard, which would render any turn lane constructed with this option merely an interim or temporary improvement.

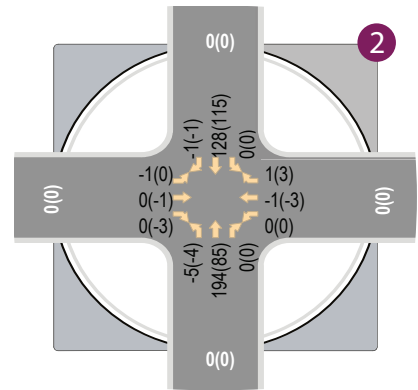


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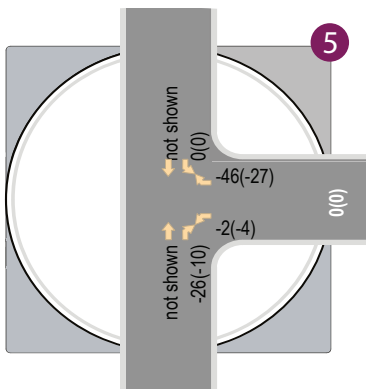
- XX(XX) - AM(PM) Peak Hour Traffic Volumes
- XX(XX) - AM(PM) Peak Hour Pedestrian Counts



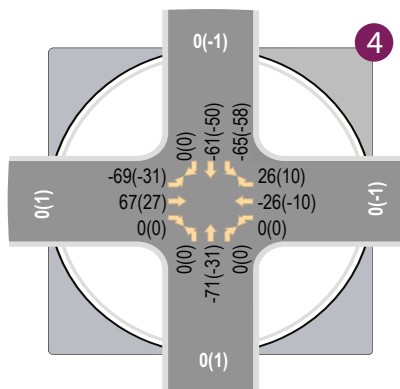
4th Avenue & Union Street



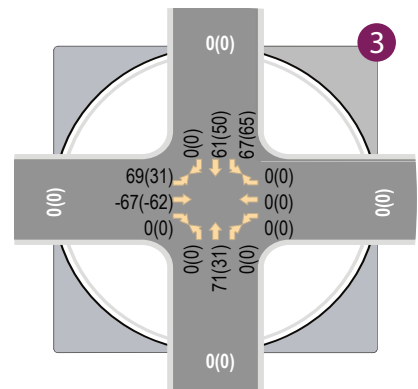
4th Avenue & Arizona Street



Main Street & Main Access

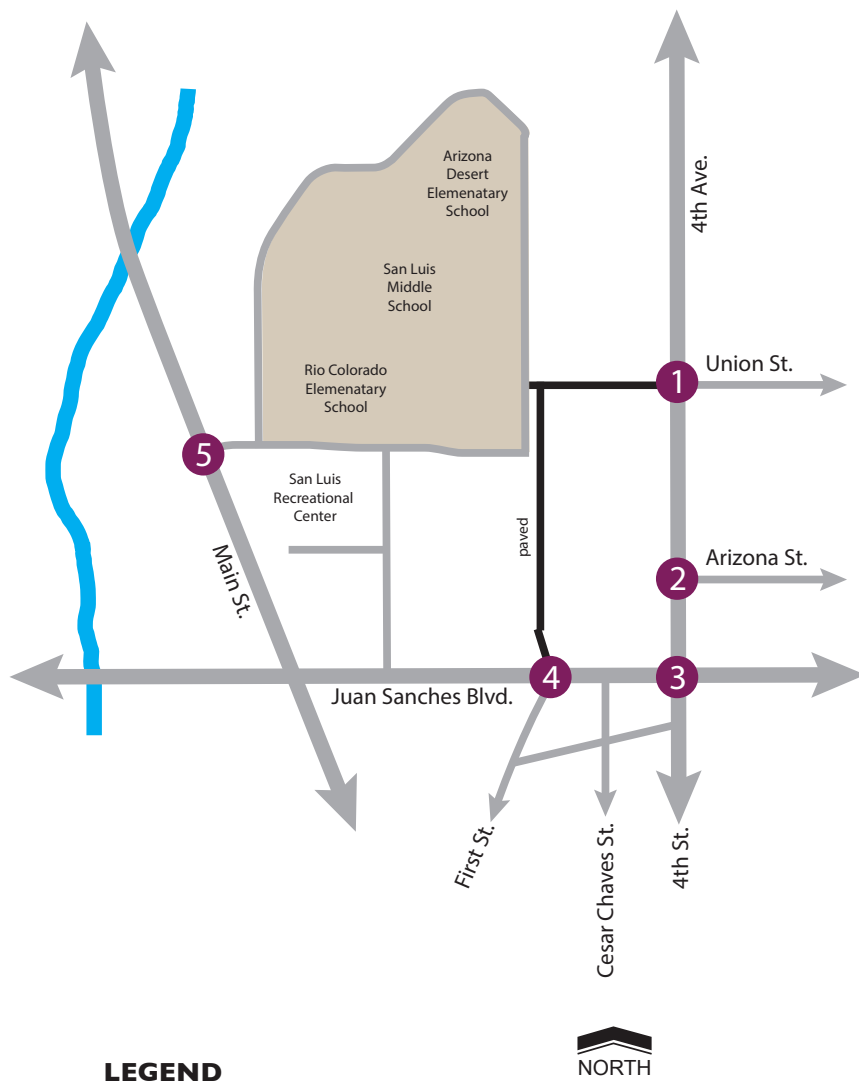


1st Avenue & Juan Sanchez Boulevard



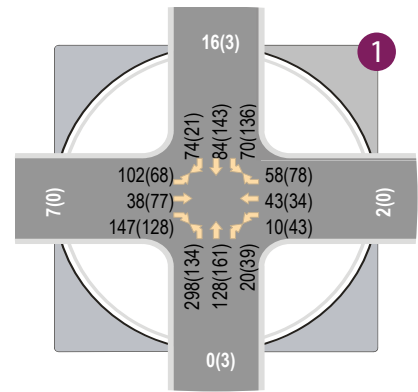
4th Ave/4th St & Juan Sanchez Boulevard

Figure 8: Option C Volume Changes

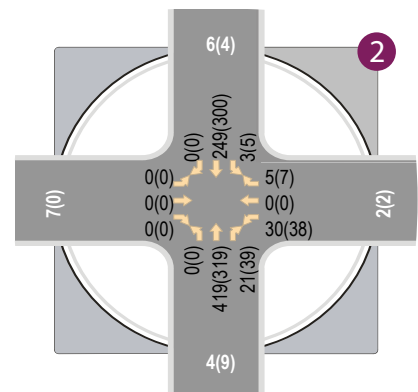


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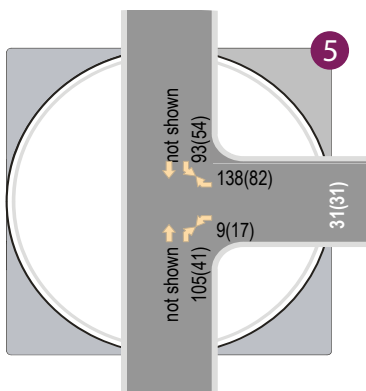
XX(X) - AM(PM) Peak Hour Traffic Volumes



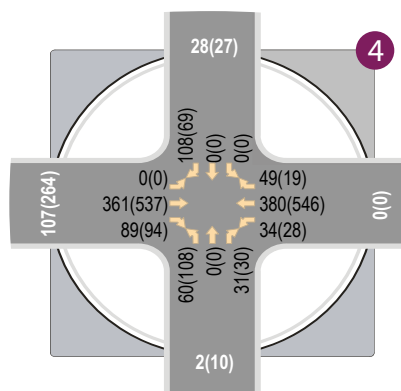
4th Avenue & Union Street



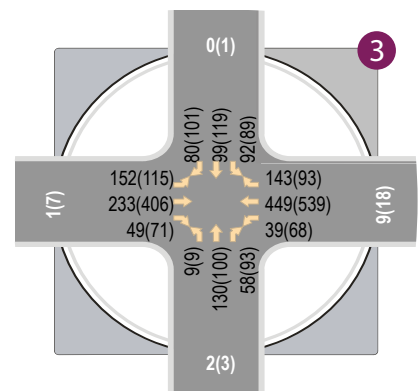
4th Avenue & Arizona Street



Main Street & Main Access



1st Avenue & Juan Sanchez Boulevard



4th Ave/4th St & Juan Sanchez Boulevard

Figure 9: Option C Final Volumes

LEVEL OF SERVICE ANALYSIS

The concept of level-of-service (LOS) uses qualitative measures that characterize operational conditions within roadway facilities. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level-of-service represents a range of operating conditions. Levels of service for intersections are defined in terms of average delay ranges for vehicles. **Table 1** lists the level-of-service criteria for signalized and unsignalized intersections. *Please note that the actual average delays that determine the levels of service are very different for signalized and unsignalized intersections. A driver waiting an average of 55 seconds to enter an unsignalized intersection from a stop sign is considered to be encountering a LOS F, whereas the same average wait at a traffic signal is LOS D. This is noted here because there may be consideration of an all-way stop-controlled (AWSC) intersection as a potential low-cost alternative to a traffic signal at either 1st Avenue or 4th Avenue at Juan Sanchez Boulevard and, if such an AWSC operates at LOS D or LOS E, the average driver may still experience less of a delay than if a [costly] signal were provided.*

Table 1: Level-of-Service Criteria

| Level of Service | Control Delay (seconds/vehicle) | |
|------------------|---------------------------------|----------------------------|
| | Signalized Intersections | Unsignalized Intersections |
| A | ≤ 10 | ≤ 10 |
| B | > 10-20 | > 10-15 |
| C | > 20-35 | > 15-25 |
| D | > 35-55 | > 25-35 |
| E | > 55-80 | > 35-50 |
| F | > 80 | > 50 |

Source: Exhibit 18-4 and Exhibit 19-1, Highway Capacity Manual 2010

AM and PM peak hour capacity analyses were conducted for the four study intersections using the methodologies presented in the *Highway Capacity Manual 2010* (HCM 2010) using Synchro traffic analysis software. For Option A, with some trips diverted away from 4th Avenue to 1st Street, it was decided to analyze the intersection of 4th Avenue at Juan Sanchez Boulevard in its current configuration with the existing two-way stop control. For Option B, since school traffic will be diverted to 4th Avenue and, as will be seen, the intersection of 4th Avenue at Juan Sanchez Boulevard already operates at poor or failing levels of service, a traffic signal is assumed.

The resulting LOS for the existing conditions and for each of the three options are summarized in **Table 2**. The worksheets for these analyses are included in **Appendix D** for the existing conditions, **Appendix E** for Option A, **Appendix F** for Option B, and **Appendix G** for Option C. The table also includes the volume-to-capacity (V/C) ratio for the lane or approach with the highest V/C ratio. A V/C ratio greater than 1.0 indicates the traffic volumes are more than a lane or approach can theoretically accommodate.

Table 2: Peak Hour Levels of Service

| ID | Intersection | Traffic Control | Movement | Existing LOS(Delay) | | Option A LOS(Delay) | | Option B LOS(Delay) | | Option C LOS(Delay) | |
|-----------------------------|---|---|--|-------------------------------------|-----------|---------------------|---------|---------------------|-------|---------------------|---------|
| | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 1 | 4 th Ave & Union St | Existing & Options B;&C All-Way Stop | NB shared | B | B | A | A | E(43.7) | C | D | C |
| | | | SB shared | B | B | A | A | C | C | B | C |
| | | | EB shared | A | B | n/a | n/a | D | C | C | C |
| | | | WB shared | A | B | B | B | B | B | B | B |
| | | Option A: One-Way Stop (WB) | Worst Case Hi Lane V/C | B | B | B | B | E | C | D | C |
| | | | | 0.386 | 0.492 | 0.098 | 0.232 | 0.902 | 0.654 | 0.827 | 0.582 |
| 2 | 4 th Ave & Arizona St | Existing 2-Way Stop (EB/WB) | SB shared | A | A | A | A | A | A | A | A |
| | | | EB Shared | B | B | n/a | n/a | n/a | n/a | n/a | n/a |
| | | | WB shared | B | B | B | B | C | C | C | C |
| | | Future 1-Way Stop (WB) | Worst Case Hi Lane V/C | B | B | B | B | C | C | C | C |
| | | | | 0.072 | 0.108 | 0.139 | 0.169 | 0.117 | 0.136 | 0.101 | 0.123 |
| 3 | 4 th Ave & Juan Sanchez Blvd | Existing & Option A: Two-Way Stop (NB/SB) | NB shared | E(38.5) | F(424+) | F(107+) | F(999+) | C | C | C | C |
| | | | SB thru/left | F(66.3) | F(869+) | F(68.3) | F(999+) | C | C | C | C |
| | | | SB right | B | C | C | C | C | C | C | C |
| | | | EB left | A | A | A | A | B | B | B | B |
| | | | EB thru/right | n/c | n/c | n/c | n/c | B | B | B | A |
| | | | WB left | A | A | A | A | B | C | B | B |
| | | | WB thru | n/c | n/c | n/c | n/c | C | C | B | C |
| | | | WB right | n/c | n/c | n/c | n/c | B | B | B | B |
| | | Options B;&C Signal | Worst Case Hi Lane V/C | F | F | F | F | C | C | C | C |
| | | | | 0.579 | 2.46 | 0.909 | 3.733 | 0.600 | 0.690 | 0.640 | 0.600 |
| | | 4 | 1 st St & Juan Sanchez Blvd | Existing & Options A&C All-Way Stop | NB shared | C | C | C | C | C | D |
| SB shared | C | | | | C | D | D | n/a | n/a | n/a | n/a |
| SB right | n/a | | | | n/a | n/a | n/a | n/a | n/a | B | B |
| EB left | B | | | | B | B | B | n/a | n/a | n/a | n/a |
| Option B: One-Way Stop (NB) | EB thru/right | | | E(42.6) | F(66.4) | E(39.2) | F(70.1) | n/a | n/a | D | F(62.0) |
| | WB left | | | B | B | B | B | A | A | A | A |
| | WB thru | | | F(64.0) | F(66.9) | F(69.2) | F(70.1) | n/a | n/a | C | E(37.3) |
| | WB right | | | F(64.0) | F(66.9) | F(69.2) | F(70.1) | n/a | n/a | A | A |
| | Worst Case Hi Lane V/C | | | F | F | F | F | C | D | D | F |
| | | | | 0.981 | 1.298 | 1.427 | 1.539 | 0.226 | 0.496 | 0.820 | 1.190 |

A review of the AM and PM peak hour intersection level of service analyses summarized in **Table 2** reveals the following on an intersection-by-intersection basis:

1. 4th Avenue & Union Street – The analyses revealed that implementation of Option A and the closure of the de facto west leg of the intersection, should improve existing good levels of service to better levels of service north- and southbound. Bringing traffic across from the schools to 4th Avenue under Option B increases the inbound trips in the morning, specifically the site-bound, northbound left turns, which is expected to cause average delays of 43.7 seconds (nearly ¾ of a minute) for the northbound movement. While such delays are considered LOS E at the unsignalized intersection, with reference to **Table 1** and as noted above, similar waits would be LOS D if this were a signalized intersection. Under Option C, in which some of the trips would not be redirected from 1st Street, the inbound volumes are lower in the morning than with Option B and no movements operate at poor or unacceptable levels of service. Not documented is a trial run with the intersection converted to two-way stop control with the north- and southbound movements free. This trial showed very poor to failing levels of service for the eastbound/outbound site vehicles at the intersection and is not considered further here.
2. 4th Avenue & Arizona Street – The analyses revealed that this intersection would be little affected by either option. All movements would continue to operate at LOS C or better under any of the options.

3. *4th Avenue & Juan Sanchez Boulevard* – The analyses revealed that, under Option A, without installation of a traffic signal (or conversion to an all-way stop, which would spread the delays around), the north- and southbound movements are expected to operate at poor to failing levels of service. With the installation of a traffic signal, as is assumed under Options B and C, it is expected that the all movements approaching the intersection would operate at not less than LOS C or with an average delay of more than 35 seconds.
4. *1st Street & Juan Sanchez Boulevard* – Under Option A, with the intersection remaining as-is and only the existing 4th Avenue traffic redirected to 1st Street, there is little change from the existing condition with east- and westbound Juan Sanchez Boulevard operating at similar levels of service with delays of similar magnitude and a law enforcement officer still required each school day. Under Option B, the existing southbound approach would be effectively closed, the existing crosswalk would be left in place and upgraded to a PHB or RRFB (the effect of which, unfortunately, cannot be analyzed using HCM 2010 methods), and, with removal of the stop signs on Juan Sanchez Boulevard, the intersection would be converted from an all-way to a one-way stop (northbound approach only). The analyses revealed that the levels of service should be improved on Juan Sanchez Boulevard during the AM peak hour and should operate at about the same LOS during the PM peak hour and the stop-controlled northbound approach would operate at LOS D. Under Option C, with all-way stop control, both accesses paved, a new westbound right turn lane into 1st Street, and the conversion of the pedestrian crossing to a PHB or RRFB, the only average delays expected to operate at poor levels of service are the east- and westbound through movements during the PM peak hour. The eastbound through movement is expected to operate at LOS F with an average delay of 62.0 seconds, just over a minute. The westbound through movement is expected to operate at LOS E with an average delay of 37.3 seconds, less than $\frac{2}{3}$ of a minute. Again with reference to **Table 1**, the eastbound delay of 62.0 seconds would be considered a “high” LOS E at a signalized intersection (55 seconds is the break point between LOS D and LOS E) and the westbound delay of 37.3 seconds would be a high LOS D at a signalized intersection (35 seconds is the break point between LOS C and LOS D). *[Another undocumented trial run that assumed the ultimate five-lane cross-section on Juan Sanchez Boulevard and all-way stop control revealed acceptable levels of service for all movements. With 1st Street just 550 feet west of 4th Avenue, this intersection may not be a viable location for another traffic signal, at least not until the all-way stop is beyond its capacity. However, it would be prudent for the City to install underground conduit and pull boxes for a future traffic signal when reconstructing Juan Sanchez Boulevard; to do so before risks these features being adversely affected by the reconstruction project.]*

Analysis: Based on the levels of service and V/C ratios on the intersection approaches, Option C, consisting of two paved accesses with access restricted to right-in/right-out only at 1st Street, a westbound right turn lane approaching 1st Street, the existing pedestrian crossing upgraded to a PHB or RRFB, and a traffic signal installed at 4th Avenue and Juan Sanchez Boulevard, offers the best comprehensive approach without having to construct capacity improvements (additional lanes, etc.) at any of the intersections.

MITIGATION AND IMPROVEMENT ANALYSIS

TRAFFIC SIGNAL NEEDS ASSESSMENT

With respect to traffic signals needs, it is suggested that the study author assumes the reader/reviewer is familiar with the requirements of the *Manual on Uniform Traffic Control Devices* (MUTCD) and simply repeat verbatim the descriptions of the warrants, etc., which is often found in a full traffic control signal warrant study. This being the case, this section will consider three of the nine warrants found in the MUTCD, Warrant 3, based on peak hour volumes; Warrant 4, based on pedestrian volumes; and Warrant 5, which is considered when there is a school crossing.

Warrant 3, Peak Hour. With three schools in the Gadsden Elementary School complex north of Joe Orduño Memorial Park, it is likely that there is a surge of southbound traffic during either the AM or school PM peak hour as parents leave the schools after having dropped off or picked up their children. Typically applied in special circumstances (such as an office or factory where outbound trips peak during a very short period of time at the end of a shift or work day), if the number of vehicles on a minor street approach exceeds a certain number determined in part on the volume on the major street, a signal is warranted. In this case, with a northbound approach volume of 202 vehicles per hour (vph) sharing a single lane during the PM peak hour and a seasonally-adjusted 1,300 vph on Juan Sanchez Boulevard, the peak hour signal warranting criterion of 75 approaching vph is satisfied. As a point of information, it is noted here that under either Option B or C, the AM and PM peak hour average control delays on Juan Sanchez Boulevard are expected to be essentially the same as those being experienced on Juan Sanchez Boulevard presently at 1st Street. With volumes expected to greater than capacity on Juan Sanchez Boulevard approaching 4th Avenue in both directions, either Juan Sanchez Boulevard should be widened to provide additional capacity or a signal should be installed to give priority to the through traffic on Juan Sanchez Boulevard while assuring that adequate time is given to the traffic approaching from the side streets.

Warrant 4, Pedestrian Volume. Depending on the volume on Juan Sanchez Boulevard, a signal may be warranted for reasons of as few as 93 pedestrians crossing during a peak hour. The pedestrian counts recorded in May 2015 show a maximum of 263 pedestrian per hour crossing Juan Sanchez Boulevard at 1st Street; therefore, the pedestrian peak hour warrant is met. Of the four hours of pedestrian counts recorded in May, there are just three one-hour periods in which 75 crossings per hour were exceeded; thus, it cannot be determined for certain if the four-hour pedestrian warrant is met since it requires four hours of 75 or more pedestrians.

Warrant 5, School Crossing. This warrant is met when there are a minimum of 20 schoolchildren crossing during the peak hour and the number of adequate gaps in the traffic stream during the period when the schoolchildren are using the crossing is less than the number of minutes in the same period. CivTech did not conduct a study of the frequency and adequacy of gaps in the traffic stream along Juan Sanchez Boulevard. Such a study was not considered necessary because the intersection is all-way stop-controlled, creating gaps in the traffic and allowing schoolchildren and others to cross. The traffic counts recorded for CivTech did not distinguish between schoolchildren and other pedestrians; however, with a maximum pedestrian crossing volume of 263 pedestrians per hour and three nearby schools, it could be assumed that the minimum peak hour volume of 20 crossing schoolchildren is very likely met.

Analysis. To summarize the above assessments, a traffic signal at the intersection of 4th Avenue and Juan Sanchez Boulevard may currently be warranted. However, it must be cautioned that satisfying a warrant does not require that a traffic signal be installed. If the City determines that the anticipated delays at the intersection in an all-way stop condition are acceptable for the foreseeable future, then a signal does not have to be provided. This may be part of a “wait-and-see” approach to see if the predicted delays actually occur. With the existing all-way stop at 1st Street, traffic may be metered such that the anticipated delays do not materialize.

ALTERNATIVES MODES

The Safe Routes to School program was a federally-funded program that ended in 2012 that would reimburse entities that implemented programs and strategies that promoted elementary and middle school children to walk and bicycle to school in part by identifying or providing alternative routes and/or making existing routes safer and more convenient. Although the program as it was known has ended, the aims of the original program are still being furthered under the broader funding category of Transportation Alternatives.

This is of note only as a way to introduce the subject of this brief section, which is the availability of facilities that could encourage the use of alternative modes of travel to and from the schools, that is, modes other than motorized vehicles (passenger vehicles and school buses). Two of the obvious facilities that could be provided are sidewalks and bicycle lanes.

The CivTech engineer who documented and photographed the area during a field review, noted that there was a lack of sidewalk along the east side of 4th Avenue. The photos and a review of aerial photography reveal the absence of sidewalk elsewhere where student travel on foot or by bicycle. Also, there are no bicycle lanes on Juan Sanchez Boulevard, 1st Street, or 4th Avenue. The heavy pedestrian volumes at 1st Street revealed that pedestrians do not require sidewalks; however, separate facilities for motorized and non-motorized travel are desirable if such can be provided. The following is a summary of areas where sidewalk is not currently provided along the routes to the schools:

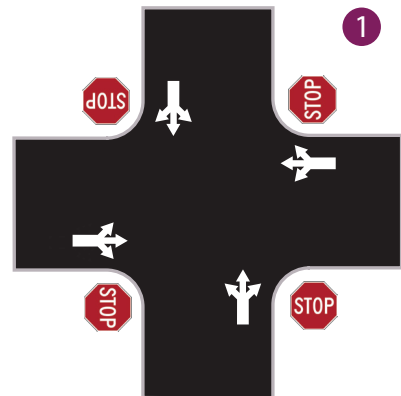
- 1st Street – east and west sides, Juan Sanchez Boulevard south to E Street
- 4th Avenue – west side, Juan Sanchez Boulevard south to E Street
- 4th Avenue – east side, Juan Sanchez Boulevard south to south of E Street
- 4th Avenue – east side, Juan Sanchez Boulevard north to Arizona Street
- 4th Avenue – west side, Juan Sanchez Boulevard north to Union Street
- Juan Sanchez Boulevard – north and south sides, 1st Street to 4th Avenue

PREFERRED ALTERNATIVE

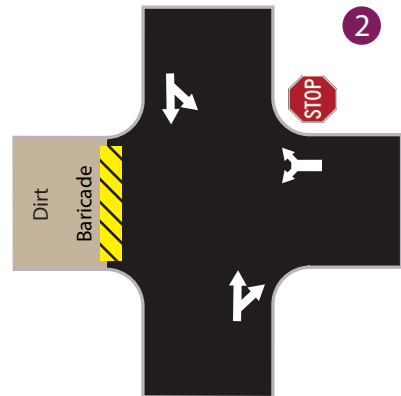
Based on the foregoing, CivTech recommends Option C as the preferred alternative. Under Option C, with two paved accesses and the access to Juan Sanchez Boulevard at 1st Street restricted to right-in/right-out movements only, some portion of the vehicular trips will be directed from the school site east to 4th Avenue and the majority of the schoolchildren will be allowed to cross at 1st Street as they currently do. The operation of the existing crosswalk would be enhanced by upgrading to a PHB or RRFB crossing and a school crossing guard could be used instead of a law enforcement officer as is now needed. The operation of the intersection of 4th Avenue and Juan Sanchez Boulevard would also be enhanced by the installation of a traffic signal, warrants for which are already satisfied by existing traffic volumes. The recommended lane configurations and traffic controls for Option C, the preferred option, are illustrated in **Figure 10**.

LEGEND

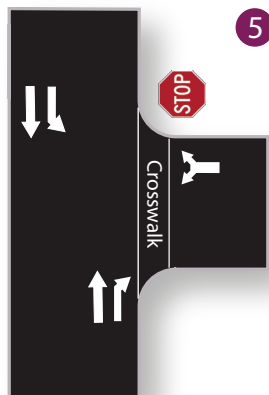
| | | | |
|--|--------------------------|--|----------------|
| | Thru or Turning Movement | | Traffic Signal |
| | Two-Way Left Turn-Lane | | Stop Sign |
| | Pedestrian Signal | | Speed Limit |



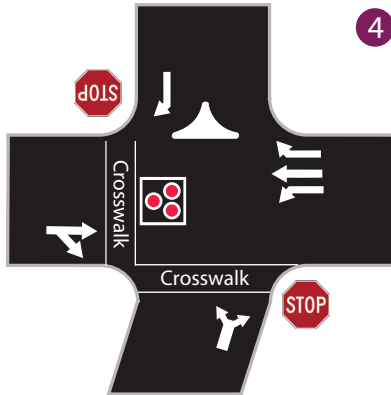
4th Avenue & Union Street



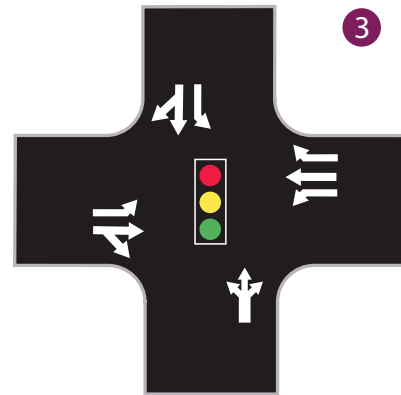
4th Avenue & Arizona Street



Main Street & Main Access



1st Avenue & Juan Sanchez Boulevard



4th Ave/4th St & Juan Sanchez Boulevard

Figure 10: Recommended Lane Configurations and Traffic Controls

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been documented in this study:

- ◆ The AM and PM peak hour intersection level of service analyses for the existing conditions and the conditions expected under each option revealed the following on an intersection-by-intersection basis:
 - 4th Avenue & Union Street – The analyses revealed that implementation of Option A and the closure of the de facto west leg of the intersection, should improve existing good levels of service to better levels of service north- and southbound. Bringing traffic across from the schools to 4th Avenue under Option B or C increases the inbound trips in the morning, specifically the site-bound, northbound left turns, which is expected to cause average delays of 43.7 seconds (nearly $\frac{3}{4}$ of a minute) for the northbound movement. While such delays are considered LOS E at the unsignalized intersection, as noted above, similar waits would be LOS D if this were a signalized intersection. Under Option C, in which some of the trips would not be redirected from 1st Street, the inbound volumes are lower in the morning than with Option B and no movements operate at poor or unacceptable levels of service.
 - 4th Avenue & Arizona Street – The analyses revealed that this intersection would be little affected by either option. All movements would continue to operate at LOS C or better under any of the options.
 - 4th Avenue & Juan Sanchez Boulevard – The analyses revealed that, under Option A, without installation of a traffic signal (or conversion to an all-way stop, which would spread the delays around), the north- and southbound movements are expected to operate at poor to failing levels of service. With the installation of a traffic signal, as is assumed under Options B and C, it is expected that the all movements approaching the intersection would operate at not less than LOS C or with an average delay of more than 35 seconds.
 - 1st Street & Juan Sanchez Boulevard – Under Option A, with the intersection remaining as-is and only the existing 4th Avenue traffic redirected to 1st Street, there is little change from the existing condition with east- and westbound Juan Sanchez Boulevard operating at similar levels of service with delays of similar magnitude and a law enforcement officer still required each school day. Under Option B, the existing southbound approach would be effectively closed, the existing crosswalk would be left in place and upgraded to a PHB or RRFB (the effect of which, unfortunately, cannot be analyzed using HCM 2010 methods), and, with removal of the stop signs on Juan Sanchez Boulevard, the intersection would be converted from an all-way to a one-way stop (northbound approach only). The analyses revealed that the levels of service should be improved on Juan Sanchez Boulevard during the AM peak hour and should operate at about the same LOS during the PM peak hour and the stop-controlled northbound approach would operate at LOS D. Under Option C, with all-way stop control, both accesses paved, a new westbound right turn lane into 1st Street, and the conversion of the pedestrian crossing to a PHB or RRFB, the only average delays expected to operate at poor levels of service are the east- and westbound through movements during the PM peak hour. The

- eastbound through movement is expected to operate at LOS F with an average delay of 62.0 seconds, just over a minute. The westbound through movement is expected to operate at LOS E with an average delay of 37.3 seconds, less than $\frac{2}{3}$ of a minute. The eastbound delay of 62.0 seconds would be considered a “high” LOS E at a signalized intersection (55 seconds is the break point between LOS D and LOS E) and the westbound delay of 37.3 seconds would be a high LOS D at a signalized intersection (35 seconds is the break point between LOS C and LOS D).
- *Analysis:* Based on the levels of service and V/C ratios on the intersection approaches, Option C, consisting of two paved accesses with access restricted to right-in/right-out only at 1st Street, a westbound right turn lane approaching 1st Street, the existing pedestrian crossing upgraded to a PHB or RRFB, and a traffic signal installed at 4th Avenue and Juan Sanchez Boulevard, offers the best comprehensive approach without having to construct capacity improvements (additional lanes, etc.) at any of the intersections.
 - ◆ To summarize the traffic signal needs assessment, a traffic signal at the intersection of 4th Avenue and Juan Sanchez Boulevard may currently be warranted. However, it must be cautioned that satisfying a warrant does not dictate that a traffic signal must be installed. If the City determines that the anticipated delays at the intersection in an all-way stop condition are acceptable for the foreseeable future, then a signal does not have to be provided. This may be part of a “wait-and-see” approach to see if the predicted delays actually occur. With the existing all-way stop at 1st Street, traffic may be metered such that the anticipated delays do not materialize.
 - ◆ The heavy pedestrian volumes at 1st Street revealed that pedestrians do not require sidewalks; however, separate facilities for motorized and non-motorized travel are desirable if such can be provided. The following is a summary of areas where sidewalk is not currently provided along the routes to the schools:
 - 1st Street – east and west sides, Juan Sanchez Boulevard south to E Street
 - 4th Avenue – west side, Juan Sanchez Boulevard south to E Street
 - 4th Avenue – east side, Juan Sanchez Boulevard south to south of E Street
 - 4th Avenue – east side, Juan Sanchez Boulevard north to Arizona Street
 - 4th Avenue – west side, Juan Sanchez Boulevard north to Union Street
 - Juan Sanchez Boulevard – north and south sides, 1st Street to 4th Avenue
 - ◆ CivTech recommends Option C as the preferred alternative. Under Option C, with two paved accesses and the access to Juan Sanchez Boulevard at 1st Street restricted to right-in/right-out movements only, some portion of the vehicular trips will be directed from the school site to the east to 4th Avenue and the majority of the schoolchildren will be allowed to cross at 1st Street as they currently do. The operation of the existing crosswalk would be enhanced by upgrading to a PHB or RRFB crossing and a school crossing guard could be used instead of a law enforcement officer as is now needed. The operation of the intersection of 4th Avenue and Juan Sanchez Boulevard would also be enhanced by the installation of a traffic signal, warrants for which are already satisfied by existing traffic volumes.

LIST OF REFERENCES

A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials, Washington, D.C., 2011.

Highway Capacity Manual. Transportation Research Board, Washington, D.C., 2010.

Manual on Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

NPTS Urban Travel Patterns Report. December 1999.

Trip Generation Manual, 9th Edition. Institute of Transportation Engineers, Washington, D.C, 2012.

Trip Generation Handbook, 2nd Edition, Institute of Transportation Engineers, Washington, D.C., 2004.

TECHNICAL APPENDIX

| | |
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| APPENDIX A | CITY COMMENTS ON DRAFT STUDY |
| APPENDIX B | PHOTOGRAPHS AND TRAFFIC COUNTS |
| APPENDIX C | RECTANGULAR RAPID FLASHING BEACON INFORMATION |
| APPENDIX D | EXISTING PEAK HOUR CAPACITY ANALYSIS |
| APPENDIX E | OPTION A PEAK HOUR CAPACITY ANALYSIS |
| APPENDIX F | OPTION B PEAK HOUR CAPACITY ANALYSIS |
| APPENDIX G | OPTION C PEAK HOUR CAPACITY ANALYSIS |

APPENDIX A

CITY COMMENTS ON DRAFT STUDY

From: Eulogio Vera [<mailto:evera@cityofsanluis.org>]
Sent: Monday, August 10, 2015 4:47 PM
To: Douglas Nicholls <dnicholls@core-e-g.com>
Cc: Kevin Burge <kburge@core-e-g.com>; Manuel Rojas <MRojas@cityofsanluis.org>
Subject: RE: Traffic Study - 4th Av/1st Draft

Doug-

I got them started and since you were out put them aside but here they are.

Gadsden School District Schools

Page 1

- Exec. Summary - The City is not dictating that a single access is necessary. Intent of study is to recommend what is best and sufficient for the needs. Maybe a right in and right out at 1st and JSB is good and does not greatly impact traffic on JSB but provides another place for traffic to leave the schools and not necessarily have to impact the other two intersections (Union and 4th and JSB and 4th).
- Option C is mentioned but not provided in report.

Page 3

- A crossing guard may always be necessary at 1st and JSB due to the flow of school pedestrians.
- Right in and right out at 1st and JSB may provide additional support for access and for exiting the school zone.

Page 4

- Intro. Paragraph - Study to determine how many accesses. It could be one or two.

Page 6

- Ex. Cond. Second Paragraph - number of paved access roads to be determined by study. State Land just waiting for School Dist. to ask for the land that is needed.

Page 11

- Proposed Alt. - First paragraph. Not sure muddy would be the correct word but maybe some minor ponding.
- The City does not have much experience with HAWK crossings but the one on Main will probably not function in the winter due to the high pedestrian volume.

Page 18

- If capacity improvements (additional lanes or tapers) are needed and will make the road infrastructure function at a good level of service, now is the time to implement them.

Page 22

- Mentioning of option C, not included.
- Final level of service seem fairly low.

In general I think we need to look further into the using both First Avenue as well as Union to dissipate traffic from the schools. Looks like one access would not improve too much and would probably make at least one intersection worse. Please review and let me know if you have any questions.

Thanks
Eulogio

APPENDIX B

PHOTOGRAPHS AND TRAFFIC COUNTS



1. 1st looking south from NS access



2. 4 way stop JSB-1st NS Access



3. Left in, right in access 90 feet west of NS Access



4. NEC 4th looking west



5. NEC 4th sign



6. NEC 4th Street



7. North south access along school to JSB



8. NWC 4th looking north



9. NWC 4th looking south



10. NWC 4th looking west



11. NWC bollards



12. NWC NS access at JSB



13. NWC Utility Vault by NS Access



14. NWC 4th looking NW at school



15. Ped ramp, crosswalk west of 1st close-up looking south



16. Ped ramp, crosswalk west of 1st close-up



17. Ped ramp, crosswalk west of 1st



18. SEC 4th looking north



19. SEC Utilities



20. Signing NS access 2



21. Signing NS access 3



22. Signing on dirt NS access



23. SWC 1st crosswalk to north Access



24. SWC 1st utility, crossing signs



25. SWC 4th looking east



26. SWC 4th Utility bollards



27. SWC looking east at crosswalk across 1st



28. SWC looking south



29. Union Access looking east



30. Union looking west at school dirt road access



31. WB approach east of 4th

APPENDIX C

RECTANGULAR RAPID FLASHING BEACON INFORMATION



Rectangular Rapid Flash Beacon (RRFB)

Purpose

According to the National Highway Traffic Safety Administration, there were a total of 14,340 pedestrian fatalities and 193,000 pedestrian injuries resulting from pedestrian-vehicle crashes nationwide during the 2004-2006 period. Rectangular Rapid Flash Beacons (RRFB) can enhance safety by reducing crashes between vehicles and pedestrians at unsignalized intersections and mid-block pedestrian crossings by increasing driver awareness of potential pedestrian conflicts.

Alternative Names

Light Emitting Diode (LED) Rapid-Flash System, Stutter Flash or LED Beacons.

Operation

- RRFBs are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system.
- RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles.
- RRFBs may be installed on either two-lane or multi-lane roadways.

Potential Benefits

- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.
- An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.
- The novelty and unique nature of the stutter flash may elicit a greater response from drivers than traditional methods.
- The addition of RRFB may also increase the safety effectiveness of other treatments, such as the use of advance yield markings with YIELD (or STOP) HERE FOR PEDESTRIANS signs. These signs and markings are used to reduce the incidence of multiple-threat crashes at crosswalks on multi-lane roads (i.e., crashes where a vehicle in one lane stops to allow a pedestrian to cross the street while a vehicle in an adjacent lane, traveling in the same direction, strikes the pedestrian), but alone they only have a small effect on overall driver yielding rates.



This summary is one in a series describing Innovative Intersection Safety Treatments. The summaries identify new technologies and techniques to improve intersection safety developed since NCHRP Report 500, Volumes 5 and 12, were published in 2003 and 2004, respectively. These treatments show promise for improving safety but comprehensive effectiveness evaluations are not yet available.

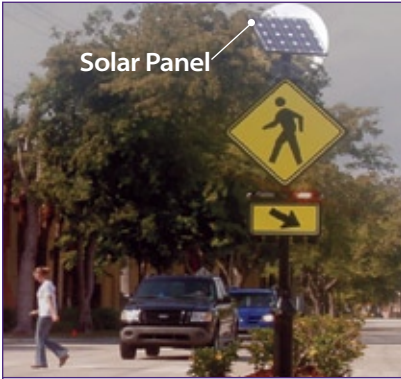


Figure 1: Activated, solar-powered RRFB on a center island at an unsignalized intersection—beacons flash using an irregular flash pattern that is similar to emergency flashers on police vehicles



Figure 2: Activated, solar-powered, roadside RRFB at a mid-block crosswalk



Figure 3: Combined roadside and median system of solar-powered RRFB

Learn More

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FHWA Office of Safety

202.366.9064

ed.rice@dot.gov

See Also:

http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/stpetersburgprpt/intro.htm
http://www.stpete.org/pdf/ite_paper_07.pdf

Agency Experience

“An Analysis of the Effects of Stutter Flash LED Beacons to Increase Yielding to Pedestrians Using Multilane Crosswalks,” along with “The Use of Stutter Flash LED Beacons to Increase Yielding to Pedestrians at Crosswalks,” presented at the Transportation Research Board Annual Meeting in 2008, summarized the results of two studies on the effects of RRFBs when used to supplement standard pedestrian crossing warning signs at crosswalks¹.

The former found that going from a no-beacon arrangement to a two-beacon system, mounted on the supplementary warning sign on the right side of the crossing, increased yielding from 18 percent to 81 percent. There was a further increase in yielding behavior, with a four-beacon system (with two beacons on both the right and left side of the crossing) to 88 percent. “An Analysis of the Effects of Stutter Flash LED Beacons to Increase Yielding to Pedestrians Using Multilane Crosswalks” also evaluated the sites over a 1-year period, and found that there was little to no decrease in yielding behavior over time.

Implementation Considerations

- Including RRFBs on the roadside increases driver yielding behavior significantly. Including RRFBs on a center island or median as well can further increase driver yielding behavior, although with a lower marginal benefit than roadside beacons.
- RRFBs can use manual push-buttons or automated passive (e.g., video or infrared) pedestrian detection, and should be unlit when not activated.
- RRFBs typically receive power by standalone solar panel units, but may also be wired to a traditional power source.

Manual on Uniform Traffic Control Devices (MUTCD) Specifications

- The MUTCD gave interim approval to RRFBs for optional use in limited circumstances in July 2008. The interim approval allows for usage as a warning beacon to supplement standard pedestrian crossing warning signs and markings at either a pedestrian or school crossing; where the crosswalk approach is not controlled by a yield sign, stop sign, or traffic-control signal; or at a crosswalk at a roundabout.
- The MUTCD interim approval memo also contains other provisions for the implementation of the device and should be reviewed (http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/fhwamemo.htm).

Costs

- Cost is approximately \$10,000 to \$15,000 for purchase and installation of two units (one on either side of a street). This includes solar panels for powering the units, pad lighting, indication units (for both sides of street) with RRFBs in the back and front of each unit, signage on both approaches, all posts, and either passive infrared detection or push buttons with audio instructions.
- Costs would be proportionately higher for additional units placed on a median island, etc.

¹The two known studies of stutter flash were both conducted in Florida—one in Miami Beach and one in St. Petersburg. They are:

Sherbutt, J., R. Van Houten, and S. Turner. “An Analysis of the Effects of Stutter Flash LED Beacons to Increase Yielding to Pedestrians Using Multilane Crosswalks.” Presented at the Transportation Research Board Annual Meeting, Washington, DC, 2008.

Van Houten, R., R. Ellis, and E. Marmolejo. “The Use of Stutter Flash LED Beacons to Increase Yielding to Pedestrians at Crosswalks.” Presented at the Transportation Research Board Annual Meeting, Washington, DC, 2008.

APPENDIX D

EXISTING PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics
1: 4th Avenue & Union Street

6/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.977 | | 0.931 | | 0.989 | | 0.957 | | | | | |
| Flt Protected | 0.976 | | 0.995 | | 0.980 | | 0.985 | | | | | |
| Satd. Flow (prot) | 0 | 1776 | 0 | 0 | 1726 | 0 | 0 | 1805 | 0 | 0 | 1756 | 0 |
| Flt Permitted | 0.976 | | 0.995 | | 0.980 | | 0.985 | | | | | |
| Satd. Flow (perm) | 0 | 1776 | 0 | 0 | 1726 | 0 | 0 | 1805 | 0 | 0 | 1756 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | | | | |
| Link Distance (ft) | 300 | | 300 | | 880 | | 300 | | | | | |
| Travel Time (s) | 8.2 | | 8.2 | | 24.0 | | 8.2 | | | | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
1: 4th Avenue & Union Street

6/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.987 | | 0.934 | | 0.979 | | 0.991 | | | | | |
| Flt Protected | 0.984 | | 0.986 | | 0.991 | | 0.978 | | | | | |
| Satd. Flow (prot) | 0 | 1809 | 0 | 0 | 1715 | 0 | 0 | 1807 | 0 | 0 | 1805 | 0 |
| Flt Permitted | 0.984 | | 0.986 | | 0.991 | | 0.978 | | | | | |
| Satd. Flow (perm) | 0 | 1809 | 0 | 0 | 1715 | 0 | 0 | 1807 | 0 | 0 | 1805 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | | | | |
| Link Distance (ft) | 300 | | 300 | | 880 | | 300 | | | | | |
| Travel Time (s) | 8.2 | | 8.2 | | 24.0 | | 8.2 | | | | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
1: 4th Avenue & Union Street

6/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 10.3 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 55 | 38 | 19 | 0 | 10 | 43 | 56 | 0 | 103 | 128 | 20 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 61 | 42 | 21 | 0 | 11 | 48 | 62 | 0 | 114 | 142 | 22 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|-----|-----|----|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 9.7 | 9.3 | 11 |
| HCM LOS | A | A | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 41% | 49% | 9% | 31% |
| Vol Thru, % | 51% | 34% | 39% | 37% |
| Vol Right, % | 8% | 17% | 51% | 32% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 251 | 112 | 109 | 228 |
| LT Vol | 128 | 38 | 43 | 85 |
| Through Vol | 20 | 19 | 56 | 73 |
| RT Vol | 103 | 55 | 10 | 70 |
| Lane Flow Rate | 279 | 124 | 121 | 253 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.38 | 0.189 | 0.175 | 0.337 |
| Departure Headway (Hd) | 4.908 | 5.465 | 5.192 | 4.783 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 722 | 660 | 694 | 742 |
| Service Time | 3.004 | 3.47 | 3.197 | 2.882 |
| HCM Lane V/C Ratio | 0.386 | 0.188 | 0.174 | 0.341 |
| HCM Control Delay | 11 | 9.7 | 9.3 | 10.3 |
| HCM Lane LOS | B | A | A | B |
| HCM 95th-tile Q | 1.8 | 0.7 | 0.6 | 1.5 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

6/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 12 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 41 | 76 | 13 | 0 | 43 | 34 | 74 | 0 | 46 | 161 | 39 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 46 | 84 | 14 | 0 | 48 | 38 | 82 | 0 | 51 | 179 | 43 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 10.7 | 10.6 | 11.9 |
| HCM LOS | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 19% | 32% | 28% | 45% |
| Vol Thru, % | 65% | 58% | 23% | 48% |
| Vol Right, % | 16% | 10% | 49% | 7% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 246 | 130 | 151 | 300 |
| LT Vol | 161 | 76 | 34 | 144 |
| Through Vol | 39 | 13 | 74 | 20 |
| RT Vol | 46 | 41 | 43 | 136 |
| Lane Flow Rate | 273 | 144 | 168 | 333 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.403 | 0.235 | 0.26 | 0.492 |
| Departure Headway (Hd) | 5.305 | 5.868 | 5.588 | 5.319 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 678 | 610 | 641 | 677 |
| Service Time | 3.349 | 3.923 | 3.643 | 3.36 |
| HCM Lane V/C Ratio | 0.403 | 0.236 | 0.262 | 0.492 |
| HCM Control Delay | 11.9 | 10.7 | 10.6 | 13.4 |
| HCM Lane LOS | B | B | B | B |
| HCM 95th-tile Q | 1.9 | 0.9 | 1 | 2.7 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

6/25/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 70 | 85 | 73 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 78 | 94 | 81 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 10.3 | | |
| HCM LOS | | B | | |
| Lane | | | | |

HCM 2010 AWSC
1: 4th Avenue & Union Street

6/25/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 136 | 144 | 20 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 151 | 160 | 22 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 13.4 | | |
| HCM LOS | | B | | |
| Lane | | | | |

Lanes and Geometrics
2: 4th Avenue & Arizona Street

6/25/2015

| 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 | | | |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | | | |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | | | | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | | | |
| Lane Util. 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 | | | |
| Ped Bike Factor | | | | | | | | | | | | | | | |
| Frt | | | | | 0.986 | | | | | 0.989 | | | | | 0.999 |
| Flt Protected | 0.950 | | | | 0.958 | | | 0.999 | | | 0.999 | | | | |
| Satd. Flow (prot) | 0 | 1770 | 0 | 0 | 1760 | 0 | 0 | 1840 | 0 | 0 | 1859 | 0 | | | |
| Flt Permitted | 0.950 | | | | 0.958 | | | 0.999 | | | 0.999 | | | | |
| Satd. Flow (perm) | 0 | 1770 | 0 | 0 | 1760 | 0 | 0 | 1840 | 0 | 0 | 1859 | 0 | | | |
| Link Speed (mph) | 25 | | | | 25 | | | 25 | | | 25 | | | | |
| Link Distance (ft) | 200 | | | | 300 | | | 420 | | | 880 | | | | |
| Travel Time (s) | 5.5 | | | | 8.2 | | | 11.5 | | | 24.0 | | | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
2: 4th Avenue & Arizona Street

6/25/2015

| 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 | | | |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | | | |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | | | | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | | | |
| Lane Util. 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 | | | |
| Ped Bike Factor | | | | | | | | | | | | | | | |
| Frt | | | | | 0.899 | | | | | 0.989 | | | | | 0.981 |
| Flt Protected | 0.950 | | | | 0.958 | | | 0.999 | | | 0.999 | | | | |
| Satd. Flow (prot) | 0 | 1675 | 0 | 0 | 1767 | 0 | 0 | 1826 | 0 | 0 | 1859 | 0 | | | |
| Flt Permitted | 0.950 | | | | 0.958 | | | 0.999 | | | 0.999 | | | | |
| Satd. Flow (perm) | 0 | 1675 | 0 | 0 | 1767 | 0 | 0 | 1826 | 0 | 0 | 1859 | 0 | | | |
| Link Speed (mph) | 25 | | | | 25 | | | 25 | | | 25 | | | | |
| Link Distance (ft) | 200 | | | | 300 | | | 420 | | | 880 | | | | |
| Travel Time (s) | 5.5 | | | | 8.2 | | | 11.5 | | | 24.0 | | | | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/25/2015

| Intersection | | | | | | | | | | |
|--------------------------|--------|-------|-------|--------|-------|-------|--------|------|------|--|
| Int Delay, s/veh | 1.2 | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | |
| Vol, veh/h | 1 | 0 | 0 | 30 | 1 | 4 | 5 | 225 | 21 | |
| Conflicting Peds, #/hr | 13 | 0 | 11 | 6 | 0 | 8 | 11 | 0 | 6 | |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | |
| RT Channelized | - | - | None | - | - | None | - | - | None | |
| Storage Length | - | - | - | - | - | - | - | - | - | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 1 | 0 | 0 | 33 | 1 | 4 | 6 | 250 | 23 | |
| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | |
| Conflicting Flow All | 439 | 447 | 159 | 436 | 436 | 283 | 149 | 0 | 0 | |
| Stage 1 | 155 | 155 | - | 281 | 281 | - | - | - | - | |
| Stage 2 | 284 | 292 | - | 155 | 155 | - | - | - | - | |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | |
| Pot Cap-1 Maneuver | 528 | 506 | 886 | 531 | 514 | 756 | 1432 | - | - | |
| Stage 1 | 847 | 769 | - | 726 | 678 | - | - | - | - | |
| Stage 2 | 723 | 671 | - | 847 | 769 | - | - | - | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | |
| Mov Cap-1 Maneuver | 510 | 493 | 868 | 519 | 501 | 743 | 1419 | - | - | |
| Mov Cap-2 Maneuver | 510 | 493 | - | 519 | 501 | - | - | - | - | |
| Stage 1 | 834 | 758 | - | 718 | 670 | - | - | - | - | |
| Stage 2 | 706 | 663 | - | 837 | 758 | - | - | - | - | |
| Approach | EB | | | WB | | | NB | | | |
| HCM Control Delay, s | 12.1 | | | 12.2 | | | 0.2 | | | |
| HCM LOS | B | | | B | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR | | |
| Capacity (veh/h) | 1419 | - | - | 510 | 537 | 1268 | - | - | | |
| HCM Lane V/C Ratio | 0.004 | - | - | 0.002 | 0.072 | 0.003 | - | - | | |
| HCM Control Delay (s) | 7.5 | 0 | - | 12.1 | 12.2 | 7.8 | 0 | - | | |
| HCM Lane LOS | A | A | - | B | B | A | A | - | | |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0.2 | 0 | - | - | | |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/25/2015

| Intersection | | | | | | | | | | |
|--------------------------|--------|-------|-------|--------|-------|-------|--------|------|------|--|
| Int Delay, s/veh | 1.4 | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | |
| Vol, veh/h | 0 | 1 | 3 | 38 | 3 | 4 | 4 | 234 | 39 | |
| Conflicting Peds, #/hr | 4 | 0 | 9 | 11 | 0 | 6 | 9 | 0 | 11 | |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | |
| RT Channelized | - | - | None | - | - | None | - | - | None | |
| Storage Length | - | - | - | - | - | - | - | - | - | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 0 | 1 | 3 | 42 | 3 | 4 | 4 | 260 | 43 | |
| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | |
| Conflicting Flow All | 531 | 549 | 226 | 530 | 529 | 299 | 216 | 0 | 0 | |
| Stage 1 | 226 | 226 | - | 302 | 302 | - | - | - | - | |
| Stage 2 | 305 | 323 | - | 228 | 227 | - | - | - | - | |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | |
| Pot Cap-1 Maneuver | 459 | 443 | 813 | 460 | 455 | 741 | 1354 | - | - | |
| Stage 1 | 777 | 717 | - | 707 | 664 | - | - | - | - | |
| Stage 2 | 705 | 650 | - | 775 | 716 | - | - | - | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | |
| Mov Cap-1 Maneuver | 445 | 432 | 800 | 446 | 443 | 731 | 1342 | - | - | |
| Mov Cap-2 Maneuver | 445 | 432 | - | 446 | 443 | - | - | - | - | |
| Stage 1 | 768 | 708 | - | 698 | 655 | - | - | - | - | |
| Stage 2 | 691 | 641 | - | 760 | 707 | - | - | - | - | |
| Approach | EB | | | WB | | | NB | | | |
| HCM Control Delay, s | 10.5 | | | 13.7 | | | 0.1 | | | |
| HCM LOS | B | | | B | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR | | |
| Capacity (veh/h) | 1342 | - | - | 660 | 462 | 1240 | - | - | | |
| HCM Lane V/C Ratio | 0.003 | - | - | 0.007 | 0.108 | 0.004 | - | - | | |
| HCM Control Delay (s) | 7.7 | 0 | - | 10.5 | 13.7 | 7.9 | 0 | - | | |
| HCM Lane LOS | A | A | - | B | B | A | A | - | | |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0.4 | 0 | - | - | | |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/25/2015

| Intersection | | | |
|--------------------------|--------|------|------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 3 | 121 | 1 |
| Conflicting Peds, #/hr | 8 | 0 | 13 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 3 | 134 | 1 |
| Major/Minor | Major2 | | |
| Conflicting Flow All | 281 | 0 | 0 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 2.218 | - | - |
| Pot Cap-1 Maneuver | 1282 | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 1268 | - | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Approach | SB | | |
| HCM Control Delay, s | 0.2 | | |
| HCM LOS | | | |
| Minor Lane/Major Mvmt | | | |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/25/2015

| Intersection | | | |
|--------------------------|--------|------|------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 5 | 185 | 1 |
| Conflicting Peds, #/hr | 4 | 0 | 6 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 6 | 206 | 1 |
| Major/Minor | Major2 | | |
| Conflicting Flow All | 314 | 0 | 0 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 2.218 | - | - |
| Pot Cap-1 Maneuver | 1246 | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | 1240 | - | - |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Approach | SB | | |
| HCM Control Delay, s | 0.2 | | |
| HCM LOS | | | |
| Minor Lane/Major Mvmt | | | |

Lanes and Geometrics
3: 4th Avenue & Juan Sanchez Boulevard

6/25/2015

| | ↖ | → | ↗ | ↖ | ← | ↖ | ↖ | ↑ | ↗ | ↘ | ↓ | ↘ |
|---------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | 0.979 | | | 0.850 | | | 0.938 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.996 | | | 0.980 | | |
| Satd. Flow (prot) | 1770 | 1824 | 0 | 1770 | 1863 | 1583 | 0 | 1740 | 0 | 0 | 1825 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.996 | | | 0.980 | | |
| Satd. Flow (perm) | 1770 | 1824 | 0 | 1770 | 1863 | 1583 | 0 | 1740 | 0 | 0 | 1825 | 1583 |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 550 | | | 1000 | | | 300 | | | 420 | |
| Travel Time (s) | | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
3: 4th Avenue & Juan Sanchez Boulevard

6/25/2015

| | ↖ | → | ↗ | ↖ | ← | ↖ | ↖ | ↑ | ↗ | ↘ | ↓ | ↘ |
|---------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | 0.980 | | | 0.850 | | | 0.927 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.997 | | | 0.987 | | |
| Satd. Flow (prot) | 1770 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1722 | 0 | 0 | 1839 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.997 | | | 0.987 | | |
| Satd. Flow (perm) | 1770 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1722 | 0 | 0 | 1839 | 1583 |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 550 | | | 1000 | | | 300 | | | 420 | |
| Travel Time (s) | | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
3: 4th Avenue & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | | | | | | | |
|--------------------------|--------|-------|------|--------|-------|------|--------|-------|-------|
| Int Delay, s/veh | 8.3 | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
| Vol, veh/h | 83 | 300 | 49 | 39 | 449 | 143 | 9 | 59 | 58 |
| Conflicting Peds, #/hr | 1 | 0 | 3 | 11 | 0 | 9 | 3 | 0 | 11 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 75 | - | 75 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 92 | 333 | 54 | 43 | 499 | 159 | 10 | 66 | 64 |
| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
| Conflicting Flow All | 508 | 0 | 0 | 399 | 0 | 0 | 1172 | 1151 | 383 |
| Stage 1 | - | - | - | - | - | - | 556 | 556 | - |
| Stage 2 | - | - | - | - | - | - | 616 | 595 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1057 | - | - | 1160 | - | - | 169 | 198 | 664 |
| Stage 1 | - | - | - | - | - | - | 515 | 513 | - |
| Stage 2 | - | - | - | - | - | - | 478 | 492 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1054 | - | - | 1149 | - | - | 103 | 171 | 652 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 103 | 171 | - |
| Stage 1 | - | - | - | - | - | - | 466 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 351 | 470 | - |
| Approach | EB | | | WB | | | NB | | |
| HCM Control Delay, s | 1.7 | | | 0.5 | | | 38.5 | | |
| HCM LOS | E | | | E | | | E | | |
| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
| Capacity (veh/h) | 242 | 1054 | - | - | 1149 | - | - | 124 | 557 |
| HCM Lane V/C Ratio | 0.579 | 0.087 | - | - | 0.038 | - | - | 0.565 | 0.16 |
| HCM Control Delay (s) | 38.5 | 8.7 | - | - | 8.3 | - | - | 66.3 | 12.7 |
| HCM Lane LOS | E | A | - | - | A | - | - | F | B |
| HCM 95th %tile Q(veh) | 3.3 | 0.3 | - | - | 0.1 | - | - | 2.8 | 0.6 |

HCM 2010 TWSC
3: 4th Avenue & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | | | | | | | |
|--------------------------|----------|-------|------|--------|------|------|----------|----------|-------|
| Int Delay, s/veh | 92.6 | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
| Vol, veh/h | 84 | 468 | 71 | 68 | 536 | 93 | 9 | 69 | 93 |
| Conflicting Peds, #/hr | 8 | 0 | 10 | 21 | 0 | 19 | 10 | 0 | 21 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 75 | - | 75 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 93 | 520 | 79 | 76 | 596 | 103 | 10 | 77 | 103 |
| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
| Conflicting Flow All | 615 | 0 | 0 | 620 | 0 | 0 | 1571 | 1533 | 601 |
| Stage 1 | - | - | - | - | - | - | 767 | 767 | - |
| Stage 2 | - | - | - | - | - | - | 804 | 766 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 965 | - | - | 960 | - | - | 90 | 116 | 500 |
| Stage 1 | - | - | - | - | - | - | 395 | 411 | - |
| Stage 2 | - | - | - | - | - | - | 377 | 412 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 957 | - | - | 943 | - | - | 15 | 93 | 483 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 15 | 93 | - |
| Stage 1 | - | - | - | - | - | - | 350 | 365 | - |
| Stage 2 | - | - | - | - | - | - | 208 | 373 | - |
| Approach | EB | | | WB | | | NB | | |
| HCM Control Delay, s | 1.2 | | | 0.9 | | | \$ 422.6 | | |
| HCM LOS | E | | | E | | | F | | |
| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
| Capacity (veh/h) | 111 | 957 | - | - | 943 | - | - | 42 | 473 |
| HCM Lane V/C Ratio | 1.712 | 0.098 | - | - | 0.08 | - | - | 2.46 | 0.237 |
| HCM Control Delay (s) | \$ 422.6 | 9.2 | - | - | 9.2 | - | - | \$ 869.7 | 15 |
| HCM Lane LOS | F | A | - | - | A | - | - | F | C |
| HCM 95th %tile Q(veh) | 14.7 | 0.3 | - | - | 0.3 | - | - | 11.1 | 0.9 |

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
3: 4th Avenue & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | |
|--------------------------|--------|-------|-------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 25 | 38 | 80 |
| Conflicting Peds, #/hr | 9 | 0 | 1 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 40 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 28 | 42 | 89 |
| Major/Minor | | | |
| | Minor2 | | |
| Conflicting Flow All | 1216 | 1178 | 511 |
| Stage 1 | 595 | 595 | - |
| Stage 2 | 621 | 583 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 158 | 191 | 563 |
| Stage 1 | 491 | 492 | - |
| Stage 2 | 475 | 499 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 90 | 165 | 557 |
| Mov Cap-2 Maneuver | 90 | 165 | - |
| Stage 1 | 445 | 470 | - |
| Stage 2 | 332 | 451 | - |
| Approach | | | |
| | SB | | |
| HCM Control Delay, s | 36.3 | | |
| HCM LOS | E | | |
| Minor Lane/Major Mvmt | | | |

HCM 2010 TWSC
3: 4th Avenue & Juan Sanchez Boulevard

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| Intersection | | | |
|--------------------------|----------|-------|-------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 24 | 69 | 101 |
| Conflicting Peds, #/hr | 19 | 0 | 8 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 40 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 27 | 77 | 112 |
| Major/Minor | | | |
| | Minor2 | | |
| Conflicting Flow All | 1623 | 1573 | 625 |
| Stage 1 | 766 | 766 | - |
| Stage 2 | 857 | 807 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 82 | 110 | 485 |
| Stage 1 | 395 | 412 | - |
| Stage 2 | 352 | 394 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | - 17 | 88 | 473 |
| Mov Cap-2 Maneuver | - 17 | 88 | - |
| Stage 1 | 351 | 373 | - |
| Stage 2 | 194 | 349 | - |
| Approach | | | |
| | SB | | |
| HCM Control Delay, s | \$ 424.7 | | |
| HCM LOS | F | | |
| Minor Lane/Major Mvmt | | | |

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

6/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.965 | | | 0.992 | | | 0.974 | | | 0.938 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.982 | 0 | 0 | 0.986 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1798 | 0 | 1770 | 1848 | 0 | 1782 | 0 | 0 | 1723 | 0 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.982 | 0 | 0 | 0.986 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 1798 | 0 | 1770 | 1848 | 0 | 1782 | 0 | 0 | 1723 | 0 | 0 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 1150 | | | 550 | | | 316 | | | 316 | | |
| Travel Time (s) | 31.4 | | | 15.0 | | | 8.6 | | | 8.6 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

6/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.977 | | | 0.998 | | | 0.976 | | | 0.947 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.969 | 0 | 0 | 0.984 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1820 | 0 | 1770 | 1859 | 0 | 1762 | 0 | 0 | 1736 | 0 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.969 | 0 | 0 | 0.984 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 1820 | 0 | 1770 | 1859 | 0 | 1762 | 0 | 0 | 1736 | 0 | 0 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 1150 | | | 550 | | | 316 | | | 316 | | |
| Travel Time (s) | 31.4 | | | 15.0 | | | 8.6 | | | 8.6 | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 40 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 69 | 294 | 89 | 0 | 34 | 406 | 23 | 0 | 60 | 71 | 31 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 77 | 327 | 99 | 0 | 38 | 451 | 26 | 0 | 67 | 79 | 34 |
| Number of Lanes | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|----|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 2 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 2 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 2 |
| HCM Control Delay | 38 | 60.1 | 17.1 |
| HCM LOS | E | F | C |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 37% | 100% | 0% | 100% | 0% | 28% |
| Vol Thru, % | 44% | 0% | 77% | 0% | 95% | 26% |
| Vol Right, % | 19% | 0% | 23% | 0% | 5% | 46% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 162 | 69 | 383 | 34 | 429 | 234 |
| LT Vol | 71 | 0 | 294 | 0 | 406 | 61 |
| Through Vol | 31 | 0 | 89 | 0 | 23 | 108 |
| RT Vol | 60 | 69 | 0 | 34 | 0 | 65 |
| Lane Flow Rate | 180 | 77 | 426 | 38 | 477 | 260 |
| Geometry Grp | 2 | 7 | 7 | 7 | 7 | 2 |
| Degree of Util (X) | 0.414 | 0.172 | 0.872 | 0.084 | 0.983 | 0.558 |
| Departure Headway (Hd) | 8.274 | 8.063 | 7.379 | 7.977 | 7.423 | 7.731 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 434 | 444 | 489 | 448 | 486 | 465 |
| Service Time | 6.356 | 5.83 | 5.145 | 5.739 | 5.185 | 5.805 |
| HCM Lane V/C Ratio | 0.415 | 0.173 | 0.871 | 0.085 | 0.981 | 0.559 |
| HCM Control Delay | 17.1 | 12.5 | 42.6 | 11.5 | 64 | 20.2 |
| HCM Lane LOS | C | B | E | B | F | C |
| HCM 95th-tile Q | 2 | 0.6 | 9.3 | 0.3 | 12.8 | 3.3 |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 53.7 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 31 | 510 | 94 | 0 | 28 | 556 | 9 | 0 | 108 | 31 | 30 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 34 | 567 | 104 | 0 | 31 | 618 | 10 | 0 | 120 | 34 | 33 |
| Number of Lanes | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 2 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 2 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 2 |
| HCM Control Delay | 63.7 | 64.3 | 17.1 |
| HCM LOS | F | F | C |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 64% | 100% | 0% | 100% | 0% | 33% |
| Vol Thru, % | 18% | 0% | 84% | 0% | 98% | 28% |
| Vol Right, % | 18% | 0% | 16% | 0% | 2% | 39% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 169 | 31 | 604 | 28 | 565 | 177 |
| LT Vol | 31 | 0 | 510 | 0 | 556 | 50 |
| Through Vol | 30 | 0 | 94 | 0 | 9 | 69 |
| RT Vol | 108 | 31 | 0 | 28 | 0 | 58 |
| Lane Flow Rate | 188 | 34 | 671 | 31 | 628 | 197 |
| Geometry Grp | 2 | 7 | 7 | 7 | 7 | 2 |
| Degree of Util (X) | 0.424 | 0.073 | 1 | 0.066 | 1 | 0.433 |
| Departure Headway (Hd) | 8.137 | 7.656 | 7.045 | 7.659 | 7.147 | 7.926 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 443 | 467 | 517 | 467 | 508 | 456 |
| Service Time | 6.171 | 5.417 | 4.806 | 5.42 | 4.908 | 5.958 |
| HCM Lane V/C Ratio | 0.424 | 0.073 | 1.298 | 0.066 | 1.236 | 0.432 |
| HCM Control Delay | 17.1 | 11 | 66.4 | 11 | 66.9 | 16.9 |
| HCM Lane LOS | C | B | F | B | F | C |
| HCM 95th-tile Q | 2.1 | 0.2 | 13.8 | 0.2 | 13.7 | 2.1 |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

6/25/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 65 | 61 | 108 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 72 | 68 | 120 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 2 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 2 | | |
| HCM Control Delay | | 20.2 | | |
| HCM LOS | | C | | |
| Lane | | | | |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

6/25/2015


| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 58 | 50 | 69 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 64 | 56 | 77 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 2 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 2 | | |
| HCM Control Delay | | 16.9 | | |
| HCM LOS | | C | | |
| Lane | | | | |

APPENDIX E

OPTION A PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics
1: 4th Avenue & Union Street

6/26/2015


| |  | | | | | |
|---------------------|---|------|-------|------|------|------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↙ | | ↑ | ↘ | | ↙ |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | |
| Storage Length (ft) | 0 | 0 | 0 | | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | | 0 | 0 |
| Taper Length (ft) | 25 | | 25 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.885 | | 0.982 | | | |
| Flt Protected | 0.993 | | 0.985 | | | |
| Satd. Flow (prot) | 1637 | 0 | 1829 | 0 | 0 | 1835 |
| Flt Permitted | 0.993 | | 0.985 | | | |
| Satd. Flow (perm) | 1637 | 0 | 1829 | 0 | 0 | 1835 |
| Link Speed (mph) | 25 | | 25 | | | |
| Link Distance (ft) | 300 | | 880 | | | |
| Travel Time (s) | 8.2 | | 24.0 | | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
1: 4th Avenue & Union Street

6/26/2015

| |  | | | | | |
|---------------------|---|------|-------|------|------|------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ↙ | | ↑ | ↘ | | ↙ |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | |
| Storage Length (ft) | 0 | 0 | 0 | | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | | 0 | 0 |
| Taper Length (ft) | 25 | | 25 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.915 | | 0.974 | | | |
| Flt Protected | 0.982 | | 0.978 | | | |
| Satd. Flow (prot) | 1674 | 0 | 1814 | 0 | 0 | 1822 |
| Flt Permitted | 0.982 | | 0.978 | | | |
| Satd. Flow (perm) | 1674 | 0 | 1814 | 0 | 0 | 1822 |
| Link Speed (mph) | 25 | | 25 | | | |
| Link Distance (ft) | 300 | | 880 | | | |
| Travel Time (s) | 8.2 | | 24.0 | | | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
1: 4th Avenue & Union Street

6/26/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 2.8 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 10 | 56 | 128 | 20 | 70 | 158 |
| Conflicting Peds, #/hr | 0 | 16 | 0 | 2 | 18 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 62 | 142 | 22 | 78 | 176 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 500 | 187 | 0 | 0 | 180 | 0 |
| Stage 1 | 169 | - | - | - | - | - |
| Stage 2 | 331 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 530 | 855 | - | - | 1396 | - |
| Stage 1 | 861 | - | - | - | - | - |
| Stage 2 | 728 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 489 | 831 | - | - | 1375 | - |
| Mov Cap-2 Maneuver | 489 | - | - | - | - | - |
| Stage 1 | 850 | - | - | - | - | - |
| Stage 2 | 681 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 10.3 | | 0 | | 2.4 | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 751 | 1375 | - | |
| HCM Lane V/C Ratio | - | - | 0.098 | 0.057 | - | |
| HCM Control Delay (s) | - | - | 10.3 | 7.8 | 0 | |
| HCM Lane LOS | - | - | B | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0.2 | - | |

HCM 2010 TWSC
1: 4th Avenue & Union Street

6/26/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 4.3 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 43 | 74 | 161 | 39 | 136 | 164 |
| Conflicting Peds, #/hr | 3 | 3 | 0 | 3 | 3 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 48 | 82 | 179 | 43 | 151 | 182 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 688 | 207 | 0 | 0 | 225 | 0 |
| Stage 1 | 204 | - | - | - | - | - |
| Stage 2 | 484 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 412 | 833 | - | - | 1344 | - |
| Stage 1 | 830 | - | - | - | - | - |
| Stage 2 | 620 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 359 | 829 | - | - | 1341 | - |
| Mov Cap-2 Maneuver | 359 | - | - | - | - | - |
| Stage 1 | 828 | - | - | - | - | - |
| Stage 2 | 541 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 13.4 | | 0 | | 3.6 | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 560 | 1341 | - | |
| HCM Lane V/C Ratio | - | - | 0.232 | 0.113 | - | |
| HCM Control Delay (s) | - | - | 13.4 | 8 | 0 | |
| HCM Lane LOS | - | - | B | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.9 | 0.4 | - | |

Lanes and Geometrics
2: 4th Avenue & Arizona Street

6/26/2015

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---------------------|-------|------|-------|------|------|-------|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | 0% |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | |
| Storage Lanes | 1 | 0 | | 0 | 0 | |
| Taper Length (ft) | 25 | | | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.994 | | 0.956 | | | |
| Flt Protected | 0.954 | | | | | 0.999 |
| Satd. Flow (prot) | 1766 | 0 | 1781 | 0 | 0 | 1861 |
| Flt Permitted | 0.954 | | | | | 0.999 |
| Satd. Flow (perm) | 1766 | 0 | 1781 | 0 | 0 | 1861 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 300 | | 420 | | | 880 |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 |

Intersection Summary

Area Type: Other

Lanes and Geometrics
2: 4th Avenue & Arizona Street

6/26/2015

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---------------------|-------|------|-------|------|------|-------|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | 0% |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | |
| Storage Lanes | 1 | 0 | | 0 | 0 | |
| Taper Length (ft) | 25 | | | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.994 | | 0.948 | | | |
| Flt Protected | 0.954 | | | | | 0.999 |
| Satd. Flow (prot) | 1766 | 0 | 1766 | 0 | 0 | 1861 |
| Flt Permitted | 0.954 | | | | | 0.999 |
| Satd. Flow (perm) | 1766 | 0 | 1766 | 0 | 0 | 1861 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 300 | | 420 | | | 880 |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/26/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 2.1 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 74 | 4 | 123 | 59 | 3 | 176 |
| Conflicting Peds, #/hr | 6 | 8 | 0 | 6 | 8 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 82 | 4 | 137 | 66 | 3 | 196 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 379 | 185 | 0 | 0 | 210 | 0 |
| Stage 1 | 177 | - | - | - | - | - |
| Stage 2 | 202 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 623 | 857 | - | - | 1361 | - |
| Stage 1 | 854 | - | - | - | - | - |
| Stage 2 | 832 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 615 | 846 | - | - | 1352 | - |
| Mov Cap-2 Maneuver | 615 | - | - | - | - | - |
| Stage 1 | 848 | - | - | - | - | - |
| Stage 2 | 826 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 11.7 | | 0 | | 0.1 | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 624 | 1352 | - | |
| HCM Lane V/C Ratio | - | - | 0.139 | 0.002 | - | |
| HCM Control Delay (s) | - | - | 11.7 | 7.7 | 0 | |
| HCM Lane LOS | - | - | B | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.5 | 0 | - | |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

6/26/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 1.9 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 75 | 4 | 188 | 116 | 5 | 193 |
| Conflicting Peds, #/hr | 11 | 6 | 0 | 11 | 4 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 83 | 4 | 209 | 129 | 6 | 214 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 510 | 288 | 0 | 0 | 349 | 0 |
| Stage 1 | 284 | - | - | - | - | - |
| Stage 2 | 226 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 523 | 751 | - | - | 1210 | - |
| Stage 1 | 764 | - | - | - | - | - |
| Stage 2 | 812 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 510 | 742 | - | - | 1206 | - |
| Mov Cap-2 Maneuver | 510 | - | - | - | - | - |
| Stage 1 | 757 | - | - | - | - | - |
| Stage 2 | 800 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 13.4 | | 0 | | 0.2 | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 518 | 1206 | - | |
| HCM Lane V/C Ratio | - | - | 0.169 | 0.005 | - | |
| HCM Control Delay (s) | - | - | 13.4 | 8 | 0 | |
| HCM Lane LOS | - | - | B | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.6 | 0 | - | |

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | 0.978 | | | 0.850 | | | 0.938 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.988 | | | 0.981 | | |
| Satd. Flow (prot) | 1770 | 1822 | 0 | 1770 | 1863 | 1583 | 0 | 1726 | 0 | 0 | 1827 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.988 | | | 0.981 | | |
| Satd. Flow (perm) | 1770 | 1822 | 0 | 1770 | 1863 | 1583 | 0 | 1726 | 0 | 0 | 1827 | 1583 |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 550 | | | 1000 | | | 300 | | | 420 | |
| Travel Time (s) | | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | 0.980 | | | 0.850 | | | 0.926 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.994 | | | 0.989 | | |
| Satd. Flow (prot) | 1770 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1715 | 0 | 0 | 1842 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.994 | | | 0.989 | | |
| Satd. Flow (perm) | 1770 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1715 | 0 | 0 | 1842 | 1583 |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 550 | | | 1000 | | | 300 | | | 420 | |
| Travel Time (s) | | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | | | | | | | |
|--------------------------|--------|-------|------|--------|-------|------|--------|-------|-------|--|
| Int Delay, s/veh | 15 | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | |
| Vol, veh/h | 92 | 303 | 52 | 39 | 506 | 86 | 30 | 38 | 58 | |
| Conflicting Peds, #/hr | 1 | 0 | 3 | 11 | 0 | 9 | 3 | 0 | 11 | |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | |
| RT Channelized | - | - | None | - | - | None | - | - | None | |
| Storage Length | 100 | - | - | 75 | - | 75 | - | - | - | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 102 | 337 | 58 | 43 | 562 | 96 | 33 | 42 | 64 | |
| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | |
| Conflicting Flow All | 571 | 0 | 0 | 405 | 0 | 0 | 1257 | 1239 | 388 | |
| Stage 1 | - | - | - | - | - | - | 581 | 581 | - | |
| Stage 2 | - | - | - | - | - | - | 676 | 658 | - | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | |
| Pot Cap-1 Maneuver | 1002 | - | - | 1154 | - | - | 148 | 175 | 660 | |
| Stage 1 | - | - | - | - | - | - | 499 | 500 | - | |
| Stage 2 | - | - | - | - | - | - | 443 | 461 | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | |
| Mov Cap-1 Maneuver | 999 | - | - | 1143 | - | - | 63 | 149 | 648 | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 63 | 149 | - | |
| Stage 1 | - | - | - | - | - | - | 444 | 445 | - | |
| Stage 2 | - | - | - | - | - | - | 232 | 440 | - | |
| Approach | EB | | | WB | | | NB | | | |
| HCM Control Delay, s | 1.9 | | | 0.5 | | | 107.8 | | | |
| HCM LOS | F | | | | | | | | | |
| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 | |
| Capacity (veh/h) | 154 | 999 | - | - | 1143 | - | - | 114 | 513 | |
| HCM Lane V/C Ratio | 0.909 | 0.102 | - | - | 0.038 | - | - | 0.536 | 0.405 | |
| HCM Control Delay (s) | 107.8 | 9 | - | - | 8.3 | - | - | 68.3 | 16.7 | |
| HCM Lane LOS | F | A | - | - | A | - | - | F | C | |
| HCM 95th %tile Q(veh) | 6.4 | 0.3 | - | - | 0.1 | - | - | 2.5 | 1.9 | |

HCM 2010 TWSC
3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | | | | | | | |
|--------------------------|--------|-------|------|--------|-------|------|--------|-----------|-------|--|
| Int Delay, s/veh | 75.2 | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | |
| Vol, veh/h | 145 | 473 | 73 | 68 | 557 | 72 | 22 | 56 | 93 | |
| Conflicting Peds, #/hr | 8 | 0 | 10 | 21 | 0 | 19 | 10 | 0 | 21 | |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | |
| RT Channelized | - | - | None | - | - | None | - | - | None | |
| Storage Length | 100 | - | - | 75 | - | 75 | - | - | - | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 161 | 526 | 81 | 76 | 619 | 80 | 24 | 62 | 103 | |
| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | |
| Conflicting Flow All | 638 | 0 | 0 | 628 | 0 | 0 | 1734 | 1698 | 608 | |
| Stage 1 | - | - | - | - | - | - | 909 | 909 | - | |
| Stage 2 | - | - | - | - | - | - | 825 | 789 | - | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | |
| Pot Cap-1 Maneuver | 946 | - | - | 954 | - | - | 69 | 92 | 496 | |
| Stage 1 | - | - | - | - | - | - | 329 | 354 | - | |
| Stage 2 | - | - | - | - | - | - | 367 | 402 | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | |
| Mov Cap-1 Maneuver | 938 | - | - | 937 | - | - | - | 68 | 479 | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | 68 | - | |
| Stage 1 | - | - | - | - | - | - | 268 | 288 | - | |
| Stage 2 | - | - | - | - | - | - | 169 | 364 | - | |
| Approach | EB | | | WB | | | NB | | | |
| HCM Control Delay, s | 2 | | | 0.9 | | | - | | | |
| HCM LOS | - | | | | | | | | | |
| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 | |
| Capacity (veh/h) | - | 938 | - | - | 937 | - | - | 25 | 459 | |
| HCM Lane V/C Ratio | - | 0.172 | - | - | 0.081 | - | - | 3.733 | 0.368 | |
| HCM Control Delay (s) | - | 9.6 | - | - | 9.2 | - | - | \$ 1551.5 | 17.3 | |
| HCM Lane LOS | - | A | - | - | A | - | - | F | C | |
| HCM 95th %tile Q(veh) | - | 0.6 | - | - | 0.3 | - | - | 11.6 | 1.7 | |

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| Intersection | | | |
|--------------------------|--------|-------|-------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 22 | 33 | 187 |
| Conflicting Peds, #/hr | 9 | 0 | 1 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 40 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 24 | 37 | 208 |
| Major/Minor | | | |
| | Minor2 | | |
| Conflicting Flow All | 1292 | 1268 | 574 |
| Stage 1 | 658 | 658 | - |
| Stage 2 | 634 | 610 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 140 | 168 | 518 |
| Stage 1 | 453 | 461 | - |
| Stage 2 | 467 | 485 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 87 | 143 | 513 |
| Mov Cap-2 Maneuver | 87 | 143 | - |
| Stage 1 | 404 | 440 | - |
| Stage 2 | 339 | 431 | - |
| Approach | | | |
| | SB | | |
| HCM Control Delay, s | 28.4 | | |
| HCM LOS | D | | |
| Minor Lane/Major Mvmt | | | |

HCM 2010 TWSC
3: 4th Street/4th Avenue & Juan Sanches Boulevard

6/26/2015

| Intersection | | | |
|--------------------------|----------|-------|-------|
| Int Delay, s/veh | | | |
| Movement | SBL | SBT | SBR |
| Vol, veh/h | 19 | 65 | 152 |
| Conflicting Peds, #/hr | 19 | 0 | 8 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 40 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 21 | 72 | 169 |
| Major/Minor | | | |
| | Minor2 | | |
| Conflicting Flow All | 1781 | 1739 | 648 |
| Stage 1 | 789 | 789 | - |
| Stage 2 | 992 | 950 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 64 | 87 | 470 |
| Stage 1 | 384 | 402 | - |
| Stage 2 | 296 | 339 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | - 8 | - 64 | 459 |
| Mov Cap-2 Maneuver | - 8 | - 64 | - |
| Stage 1 | 313 | 364 | - |
| Stage 2 | 148 | 276 | - |
| Approach | | | |
| | SB | | |
| HCM Control Delay, s | \$ 563.4 | | |
| HCM LOS | F | | |
| Minor Lane/Major Mvmt | | | |

Lanes and Geometrics
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.962 | | | 0.940 | | | 0.974 | | | 0.941 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.982 | 0 | 0 | 0.982 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1792 | 0 | 1770 | 1751 | 0 | 1782 | 0 | 0 | 1721 | 0 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.982 | 0 | 0 | 0.982 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 1792 | 0 | 1770 | 1751 | 0 | 1782 | 0 | 0 | 1721 | 0 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 1150 | | 550 | | 316 | | 316 | | 316 | | 316 | |
| Travel Time (s) | 31.4 | | 15.0 | | 8.6 | | 8.6 | | 8.6 | | 8.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.976 | | | 0.974 | | | 0.976 | | | 0.958 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.969 | 0 | 0 | 0.975 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1818 | 0 | 1770 | 1814 | 0 | 1762 | 0 | 0 | 1740 | 0 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.969 | 0 | 0 | 0.975 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 1818 | 0 | 1770 | 1814 | 0 | 1762 | 0 | 0 | 1740 | 0 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 1150 | | 550 | | 316 | | 316 | | 316 | | 316 | |
| Travel Time (s) | 31.4 | | 15.0 | | 8.6 | | 8.6 | | 8.6 | | 8.6 | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 44.7 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 99 | 262 | 89 | 0 | 34 | 369 | 245 | 0 | 60 | 71 | 31 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 110 | 291 | 99 | 0 | 38 | 410 | 272 | 0 | 67 | 79 | 34 |
| Number of Lanes | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|----|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 2 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 2 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 2 |
| HCM Control Delay | 33.7 | 66.2 | 18 |
| HCM LOS | D | F | C |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 37% | 100% | 0% | 100% | 0% | 36% |
| Vol Thru, % | 44% | 0% | 75% | 0% | 60% | 20% |
| Vol Right, % | 19% | 0% | 25% | 0% | 40% | 44% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 162 | 99 | 351 | 34 | 614 | 312 |
| LT Vol | 71 | 0 | 262 | 0 | 369 | 63 |
| Through Vol | 31 | 0 | 89 | 0 | 245 | 137 |
| RT Vol | 60 | 99 | 0 | 34 | 0 | 112 |
| Lane Flow Rate | 180 | 110 | 390 | 38 | 682 | 347 |
| Geometry Grp | 2 | 7 | 7 | 7 | 7 | 2 |
| Degree of Util (X) | 0.429 | 0.257 | 0.837 | 0.088 | 1 | 0.74 |
| Departure Headway (Hd) | 8.581 | 8.41 | 7.73 | 8.423 | 7.616 | 7.686 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 419 | 427 | 468 | 424 | 478 | 471 |
| Service Time | 6.643 | 6.164 | 5.484 | 6.195 | 5.388 | 5.731 |
| HCM Lane V/C Ratio | 0.43 | 0.258 | 0.833 | 0.09 | 1.427 | 0.737 |
| HCM Control Delay | 18 | 14.1 | 39.2 | 12 | 69.2 | 29.7 |
| HCM Lane LOS | C | B | E | B | F | D |
| HCM 95th-tile Q | 2.1 | 1 | 8.2 | 0.3 | 13.3 | 6.1 |

HCM 2010 AWSC
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 56.1 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 47 | 490 | 94 | 0 | 28 | 539 | 111 | 0 | 108 | 31 | 30 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 52 | 544 | 104 | 0 | 31 | 599 | 123 | 0 | 120 | 34 | 33 |
| Number of Lanes | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 2 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 2 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 2 |
| HCM Control Delay | 65.8 | 67.7 | 19.3 |
| HCM LOS | F | F | C |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 64% | 100% | 0% | 100% | 0% | 51% |
| Vol Thru, % | 18% | 0% | 84% | 0% | 83% | 18% |
| Vol Right, % | 18% | 0% | 16% | 0% | 17% | 31% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 169 | 47 | 584 | 28 | 650 | 288 |
| LT Vol | 31 | 0 | 490 | 0 | 539 | 52 |
| Through Vol | 30 | 0 | 94 | 0 | 111 | 90 |
| RT Vol | 108 | 47 | 0 | 28 | 0 | 146 |
| Lane Flow Rate | 188 | 52 | 649 | 31 | 722 | 320 |
| Geometry Grp | 2 | 7 | 7 | 7 | 7 | 2 |
| Degree of Util (X) | 0.462 | 0.122 | 1 | 0.073 | 1 | 0.719 |
| Departure Headway (Hd) | 8.855 | 8.386 | 7.77 | 8.4 | 7.778 | 8.089 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 407 | 425 | 467 | 424 | 469 | 448 |
| Service Time | 6.915 | 6.184 | 5.569 | 6.198 | 5.576 | 6.139 |
| HCM Lane V/C Ratio | 0.462 | 0.122 | 1.39 | 0.073 | 1.539 | 0.714 |
| HCM Control Delay | 19.3 | 12.4 | 70.1 | 11.9 | 70.1 | 29.3 |
| HCM Lane LOS | C | B | F | B | F | D |
| HCM 95th-tile Q | 2.4 | 0.4 | 13.1 | 0.2 | 13.1 | 5.6 |

HCM 2010 AWSC
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 112 | 63 | 137 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 124 | 70 | 152 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 2 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 2 | | |
| HCM Control Delay | | 29.7 | | |
| HCM LOS | | D | | |
| Lane | | | | |


HCM 2010 AWSC
4: 1st Street & Juan Sanches Boulevard

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 146 | 52 | 90 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 162 | 58 | 100 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 2 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 2 | | |
| HCM Control Delay | | 29.3 | | |
| HCM LOS | | D | | |
| Lane | | | | |

Lanes and Geometrics
4: 1st Street & Juan Sanchez Boulevard

7/13/2015




| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.92 | | 1.00 | | 0.96 | | 0.92 | | 0.95 | | 0.73 | |
| Frt | 0.962 | | 0.940 | | 0.974 | | 0.974 | | 0.897 | | 0.897 | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.982 | 0 | 0 | 0.950 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1646 | 0 | 1770 | 1683 | 0 | 0 | 1773 | 0 | 1770 | 1222 | 0 |
| Flt Permitted | 0.266 | 0 | 0 | 0.495 | 0 | 0 | 0.816 | 0 | 0 | 0.682 | 0 | 0 |
| Satd. Flow (perm) | 495 | 1646 | 0 | 920 | 1683 | 0 | 0 | 1364 | 0 | 1205 | 1222 | 0 |
| Right Turn on Red | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Satd. Flow (RTOR) | 28 | | 54 | | 16 | | 145 | | 145 | | 145 | |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 1150 | | 550 | | 316 | | 316 | | 316 | | 316 | |
| Travel Time (s) | 31.4 | | 15.0 | | 8.6 | | 8.6 | | 8.6 | | 8.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
4: 1st Street & Juan Sanchez Boulevard

7/13/2015



| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | 0.91 | | 1.00 | | 0.98 | | 0.72 | | 0.95 | | 0.64 | |
| Frt | 0.976 | | 0.974 | | 0.976 | | 0.976 | | 0.905 | | 0.905 | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.969 | 0 | 0 | 0.950 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 1654 | 0 | 1770 | 1783 | 0 | 0 | 1747 | 0 | 1770 | 1072 | 0 |
| Flt Permitted | 0.216 | 0 | 0 | 0.271 | 0 | 0 | 0.729 | 0 | 0 | 0.669 | 0 | 0 |
| Satd. Flow (perm) | 402 | 1654 | 0 | 505 | 1783 | 0 | 0 | 954 | 0 | 1181 | 1072 | 0 |
| Right Turn on Red | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Satd. Flow (RTOR) | 16 | | 17 | | 14 | | 100 | | 100 | | 100 | |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 1150 | | 550 | | 316 | | 316 | | 316 | | 316 | |
| Travel Time (s) | 31.4 | | 15.0 | | 8.6 | | 8.6 | | 8.6 | | 8.6 | |

Intersection Summary

Area Type: Other

HCM 2010 Signalized Intersection Summary
4: 1st Street & Juan Sanchez Boulevard

7/13/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Volume (veh/h) | 99 | 262 | 89 | 34 | 369 | 245 | 60 | 71 | 31 | 112 | 63 | 137 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.88 | 0.97 | | 0.97 | 0.93 | | 0.84 | 0.96 | | 0.80 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 110 | 291 | 99 | 38 | 410 | 272 | 67 | 79 | 34 | 124 | 70 | 152 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 294 | 705 | 240 | 504 | 570 | 378 | 178 | 195 | 71 | 300 | 150 | 325 |
| Arrive On Green | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Sat Flow, veh/h | 756 | 1279 | 435 | 963 | 1034 | 686 | 324 | 577 | 210 | 1227 | 444 | 965 |
| Grp Volume(v), veh/h | 110 | 0 | 390 | 38 | 0 | 682 | 180 | 0 | 0 | 124 | 0 | 222 |
| Grp Sat Flow(s),veh/h/ln | 756 | 0 | 1715 | 963 | 0 | 1721 | 1111 | 0 | 0 | 1227 | 0 | 1409 |
| Q Serve(g_s), s | 9.1 | 0.0 | 9.5 | 1.7 | 0.0 | 21.2 | 3.6 | 0.0 | 0.0 | 6.8 | 0.0 | 8.9 |
| Cycle Q Clear(g_c), s | 30.3 | 0.0 | 9.5 | 11.2 | 0.0 | 21.2 | 12.6 | 0.0 | 0.0 | 19.3 | 0.0 | 8.9 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 0.40 | 0.37 | | 0.19 | 1.00 | | 0.68 |
| Lane Grp Cap(c), veh/h | 294 | 0 | 945 | 504 | 0 | 949 | 444 | 0 | 0 | 300 | 0 | 475 |
| V/C Ratio(X) | 0.37 | 0.00 | 0.41 | 0.08 | 0.00 | 0.72 | 0.41 | 0.00 | 0.00 | 0.41 | 0.00 | 0.47 |
| Avail Cap(c_a), veh/h | 361 | 0 | 1097 | 589 | 0 | 1101 | 668 | 0 | 0 | 500 | 0 | 705 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.2 | 0.0 | 9.4 | 12.6 | 0.0 | 12.0 | 19.6 | 0.0 | 0.0 | 28.0 | 0.0 | 18.7 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 0.3 | 0.1 | 0.0 | 1.9 | 0.6 | 0.0 | 0.0 | 0.9 | 0.0 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 4.5 | 0.5 | 0.0 | 10.4 | 3.1 | 0.0 | 0.0 | 2.3 | 0.0 | 3.5 |
| LnGrp Delay(d),s/veh | 24.0 | 0.0 | 9.7 | 12.7 | 0.0 | 13.9 | 20.2 | 0.0 | 0.0 | 28.9 | 0.0 | 19.5 |
| LnGrp LOS | C | | A | B | | B | C | | | C | | B |
| Approach Vol, veh/h | 500 | | | 720 | | | | 180 | | | 346 | |
| Approach Delay, s/veh | 12.8 | | | 13.9 | | | | 20.2 | | | 22.9 | |
| Approach LOS | B | | | B | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | 28.3 | | 43.6 | | 28.3 | | 43.6 | | | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | |
| Max Green Setting (Gmax), s | | 36.0 | | 46.0 | | 36.0 | | 46.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 14.6 | | 32.3 | | 21.3 | | 23.2 | | | | |
| Green Ext Time (p_c), s | | 3.4 | | 7.4 | | 2.9 | | 9.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 16.0 | | | | | | | | | | | |
| HCM 2010 LOS | B | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
4: 1st Street & Juan Sanchez Boulevard

7/13/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Volume (veh/h) | 47 | 490 | 94 | 28 | 539 | 111 | 108 | 31 | 30 | 146 | 52 | 90 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.79 | 1.00 | | 0.97 | 0.85 | | 0.70 | 0.99 | | 0.70 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 52 | 544 | 104 | 31 | 599 | 123 | 120 | 34 | 33 | 162 | 58 | 100 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 243 | 760 | 145 | 279 | 782 | 161 | 287 | 79 | 62 | 318 | 177 | 305 |
| Arrive On Green | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 |
| Sat Flow, veh/h | 728 | 1448 | 277 | 780 | 1492 | 306 | 565 | 213 | 167 | 1316 | 476 | 821 |
| Grp Volume(v), veh/h | 52 | 0 | 648 | 31 | 0 | 722 | 187 | 0 | 0 | 162 | 0 | 158 |
| Grp Sat Flow(s),veh/h/ln | 728 | 0 | 1725 | 780 | 0 | 1798 | 945 | 0 | 0 | 1316 | 0 | 1298 |
| Q Serve(g_s), s | 4.7 | 0.0 | 22.1 | 2.4 | 0.0 | 24.6 | 8.8 | 0.0 | 0.0 | 9.0 | 0.0 | 6.7 |
| Cycle Q Clear(g_c), s | 29.3 | 0.0 | 22.1 | 24.5 | 0.0 | 24.6 | 15.5 | 0.0 | 0.0 | 24.5 | 0.0 | 6.7 |
| Prop In Lane | 1.00 | | 0.16 | 1.00 | | 0.17 | 0.64 | | 0.18 | 1.00 | | 0.63 |
| Lane Grp Cap(c), veh/h | 243 | 0 | 905 | 279 | 0 | 943 | 428 | 0 | 0 | 318 | 0 | 483 |
| V/C Ratio(X) | 0.21 | 0.00 | 0.72 | 0.11 | 0.00 | 0.77 | 0.44 | 0.00 | 0.00 | 0.51 | 0.00 | 0.33 |
| Avail Cap(c_a), veh/h | 295 | 0 | 1029 | 335 | 0 | 1072 | 537 | 0 | 0 | 443 | 0 | 606 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.2 | 0.0 | 14.0 | 23.3 | 0.0 | 14.6 | 21.5 | 0.0 | 0.0 | 30.2 | 0.0 | 17.3 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 2.1 | 0.2 | 0.0 | 3.0 | 0.7 | 0.0 | 0.0 | 1.3 | 0.0 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 11.0 | 0.5 | 0.0 | 12.8 | 3.4 | 0.0 | 0.0 | 3.4 | 0.0 | 2.5 |
| LnGrp Delay(d),s/veh | 26.7 | 0.0 | 16.0 | 23.5 | 0.0 | 17.5 | 22.2 | 0.0 | 0.0 | 31.5 | 0.0 | 17.7 |
| LnGrp LOS | C | | B | C | | B | C | | | C | | B |
| Approach Vol, veh/h | 700 | | | 753 | | | | 187 | | | 320 | |
| Approach Delay, s/veh | 16.8 | | | 17.8 | | | | 22.2 | | | 24.7 | |
| Approach LOS | B | | | B | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | 32.7 | | 44.5 | | 32.7 | | 44.5 | | | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | |
| Max Green Setting (Gmax), s | | 36.0 | | 46.0 | | 36.0 | | 46.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 17.5 | | 31.3 | | 26.5 | | 26.6 | | | | |
| Green Ext Time (p_c), s | | 3.1 | | 9.1 | | 2.2 | | 11.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 19.0 | | | | | | | | | | | |
| HCM 2010 LOS | B | | | | | | | | | | | |

Timing Report, Sorted By Phase
4: 1st Street & Juan Sanchez Boulevard

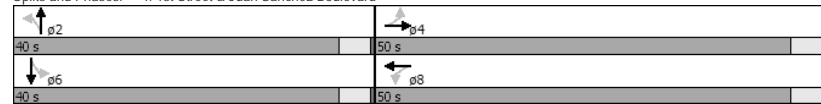
7/13/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 40 | 50 | 40 | 50 |
| Maximum Split (%) | 44.4% | 55.6% | 44.4% | 55.6% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 40 | 0 | 40 |
| End Time (s) | 40 | 0 | 40 | 0 |
| Yield/Force Off (s) | 36 | 86 | 36 | 86 |
| Yield/Force Off 170(s) | 36 | 75 | 36 | 75 |
| Local Start Time (s) | 0 | 40 | 0 | 40 |
| Local Yield (s) | 36 | 86 | 36 | 86 |
| Local Yield 170(s) | 36 | 75 | 36 | 75 |

| Intersection Summary | |
|----------------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 55 |

Splits and Phases: 4: 1st Street & Juan Sanchez Boulevard



Timing Report, Sorted By Phase
4: 1st Street & Juan Sanchez Boulevard

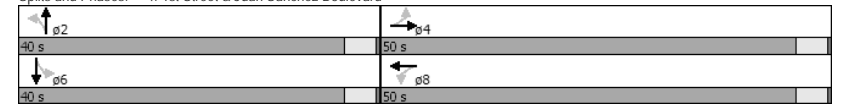
7/13/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 40 | 50 | 40 | 50 |
| Maximum Split (%) | 44.4% | 55.6% | 44.4% | 55.6% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 40 | 0 | 40 |
| End Time (s) | 40 | 0 | 40 | 0 |
| Yield/Force Off (s) | 36 | 86 | 36 | 86 |
| Yield/Force Off 170(s) | 36 | 75 | 36 | 75 |
| Local Start Time (s) | 0 | 40 | 0 | 40 |
| Local Yield (s) | 36 | 86 | 36 | 86 |
| Local Yield 170(s) | 36 | 75 | 36 | 75 |

| Intersection Summary | |
|----------------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 60 |

Splits and Phases: 4: 1st Street & Juan Sanchez Boulevard



APPENDIX F

OPTION B PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics
1: 4th Avenue & Union Street

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.913 | | 0.930 | | 0.994 | | 0.956 | | | | | |
| Flt Protected | 0.987 | | 0.996 | | 0.968 | | 0.985 | | | | | |
| Satd. Flow (prot) | 0 | 1679 | 0 | 0 | 1725 | 0 | 0 | 1792 | 0 | 0 | 1754 | 0 |
| Flt Permitted | 0.987 | | 0.996 | | 0.968 | | 0.985 | | | | | |
| Satd. Flow (perm) | 0 | 1679 | 0 | 0 | 1725 | 0 | 0 | 1792 | 0 | 0 | 1754 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | | | | |
| Link Distance (ft) | 300 | | 300 | | 880 | | 300 | | | | | |
| Travel Time (s) | 8.2 | | 8.2 | | 24.0 | | 8.2 | | | | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
1: 4th Avenue & Union Street

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.923 | | 0.932 | | 0.983 | | 0.991 | | | | | |
| Flt Protected | 0.990 | | 0.986 | | 0.978 | | 0.978 | | | | | |
| Satd. Flow (prot) | 0 | 1702 | 0 | 0 | 1712 | 0 | 0 | 1791 | 0 | 0 | 1805 | 0 |
| Flt Permitted | 0.990 | | 0.986 | | 0.978 | | 0.978 | | | | | |
| Satd. Flow (perm) | 0 | 1702 | 0 | 0 | 1712 | 0 | 0 | 1791 | 0 | 0 | 1805 | 0 |
| Link Speed (mph) | 25 | | 25 | | 25 | | 25 | | | | | |
| Link Distance (ft) | 300 | | 300 | | 880 | | 300 | | | | | |
| Travel Time (s) | 8.2 | | 8.2 | | 24.0 | | 8.2 | | | | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 30.4 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 102 | 38 | 253 | 0 | 10 | 43 | 58 | 0 | 298 | 128 | 20 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 113 | 42 | 281 | 0 | 11 | 48 | 64 | 0 | 331 | 142 | 22 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 28.3 | 13.1 | 43.7 |
| HCM LOS | D | B | E |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 67% | 26% | 9% | 31% |
| Vol Thru, % | 29% | 10% | 39% | 37% |
| Vol Right, % | 4% | 64% | 52% | 32% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 446 | 393 | 111 | 228 |
| LT Vol | 128 | 38 | 43 | 84 |
| Through Vol | 20 | 253 | 58 | 74 |
| RT Vol | 298 | 102 | 10 | 70 |
| Lane Flow Rate | 496 | 437 | 123 | 253 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.9 | 0.774 | 0.256 | 0.492 |
| Departure Headway (Hd) | 6.651 | 6.491 | 7.476 | 6.995 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 550 | 563 | 482 | 517 |
| Service Time | 4.651 | 4.491 | 5.495 | 5.005 |
| HCM Lane V/C Ratio | 0.902 | 0.776 | 0.255 | 0.489 |
| HCM Control Delay | 43.7 | 28.3 | 13.1 | 16.6 |
| HCM Lane LOS | E | D | B | C |
| HCM 95th-tile Q | 10.5 | 7.1 | 1 | 2.7 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 18.8 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 68 | 77 | 193 | 0 | 43 | 34 | 78 | 0 | 134 | 131 | 39 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 76 | 86 | 214 | 0 | 48 | 38 | 87 | 0 | 149 | 146 | 43 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 20.3 | 13.3 | 19.5 |
| HCM LOS | C | B | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 44% | 20% | 28% | 45% |
| Vol Thru, % | 43% | 23% | 22% | 48% |
| Vol Right, % | 13% | 57% | 50% | 7% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 304 | 338 | 155 | 300 |
| LT Vol | 131 | 77 | 34 | 143 |
| Through Vol | 39 | 193 | 78 | 21 |
| RT Vol | 134 | 68 | 43 | 136 |
| Lane Flow Rate | 338 | 376 | 172 | 333 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.612 | 0.651 | 0.327 | 0.608 |
| Departure Headway (Hd) | 6.524 | 6.245 | 6.837 | 6.568 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 551 | 575 | 522 | 547 |
| Service Time | 4.606 | 4.322 | 4.936 | 4.65 |
| HCM Lane V/C Ratio | 0.613 | 0.654 | 0.33 | 0.609 |
| HCM Control Delay | 19.5 | 20.3 | 13.3 | 19.4 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 4.1 | 4.7 | 1.4 | 4 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 70 | 84 | 74 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 78 | 93 | 82 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 16.6 | | |
| HCM LOS | | C | | |
| Lane | | | | |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 136 | 143 | 21 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 151 | 159 | 23 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 19.4 | | |
| HCM LOS | | C | | |
| Lane | | | | |

Lanes and Geometrics
2: 4th Avenue & Arizona Street

8/24/2015

| | ↙ ↘ | | ↑ | | ↗ ↖ | | ↓ |
|---------------------|-------|------|-------|------|------|------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | ↕ | | ↕ | | | ↕ | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | |
| Grade (%) | 0% | | 0% | | | 0% | |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | | |
| Storage Lanes | 1 | 0 | | 0 | 0 | | |
| Taper Length (ft) | 25 | | | 25 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Ped Bike Factor | | | | | | | |
| Frt | 0.979 | | 0.994 | | | | |
| Flt Protected | 0.959 | | | | | | |
| Satd. Flow (prot) | 1749 | 0 | 1852 | 0 | 0 | 1863 | |
| Flt Permitted | 0.959 | | | | | | |
| Satd. Flow (perm) | 1749 | 0 | 1852 | 0 | 0 | 1863 | |
| Link Speed (mph) | 25 | | 25 | | | 25 | |
| Link Distance (ft) | 300 | | 420 | | | 880 | |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
2: 4th Avenue & Arizona Street

8/24/2015

| | ↙ ↘ | | ↑ | | ↗ ↖ | | ↓ |
|---------------------|-------|------|-------|------|------|-------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | ↕ | | ↕ | | | ↕ | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | |
| Grade (%) | 0% | | 0% | | | 0% | |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | | |
| Storage Lanes | 1 | 0 | | 0 | 0 | | |
| Taper Length (ft) | 25 | | | 25 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Ped Bike Factor | | | | | | | |
| Frt | 0.978 | | 0.985 | | | | |
| Flt Protected | 0.960 | | | | | 0.999 | |
| Satd. Flow (prot) | 1749 | 0 | 1835 | 0 | 0 | 1861 | |
| Flt Permitted | 0.960 | | | | | 0.999 | |
| Satd. Flow (perm) | 1749 | 0 | 1835 | 0 | 0 | 1861 | |
| Link Speed (mph) | 25 | | 25 | | | 25 | |
| Link Distance (ft) | 300 | | 420 | | | 880 | |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

8/24/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 0.8 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 30 | 5 | 419 | 21 | 3 | 357 |
| Conflicting Peds, #/hr | 6 | 8 | 0 | 6 | 8 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 6 | 466 | 23 | 3 | 397 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 888 | 493 | 0 | 0 | 497 | 0 |
| Stage 1 | 485 | - | - | - | - | - |
| Stage 2 | 403 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 314 | 576 | - | - | 1067 | - |
| Stage 1 | 619 | - | - | - | - | - |
| Stage 2 | 675 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 309 | 568 | - | - | 1060 | - |
| Mov Cap-2 Maneuver | 309 | - | - | - | - | - |
| Stage 1 | 615 | - | - | - | - | - |
| Stage 2 | 669 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 17.3 | | 0 | | 0.1 | |
| HCM LOS | C | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 331 | 1060 | - | |
| HCM Lane V/C Ratio | - | - | 0.117 | 0.003 | - | |
| HCM Control Delay (s) | - | - | 17.3 | 8.4 | 0 | |
| HCM Lane LOS | - | - | C | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.4 | 0 | - | |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

8/24/2015

| Intersection | | | | | | |
|--------------------------|--------|-------|--------|-------|--------|------|
| Int Delay, s/veh | 1 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Vol, veh/h | 38 | 7 | 319 | 39 | 5 | 369 |
| Conflicting Peds, #/hr | 11 | 6 | 0 | 11 | 4 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 42 | 8 | 354 | 43 | 6 | 410 |
| Major/Minor | Minor1 | | Major1 | | Major2 | |
| Conflicting Flow All | 808 | 391 | 0 | 0 | 409 | 0 |
| Stage 1 | 387 | - | - | - | - | - |
| Stage 2 | 421 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 350 | 658 | - | - | 1150 | - |
| Stage 1 | 686 | - | - | - | - | - |
| Stage 2 | 662 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 341 | 650 | - | - | 1146 | - |
| Mov Cap-2 Maneuver | 341 | - | - | - | - | - |
| Stage 1 | 680 | - | - | - | - | - |
| Stage 2 | 651 | - | - | - | - | - |
| Approach | WB | | NB | | SB | |
| HCM Control Delay, s | 16.3 | | 0 | | 0.1 | |
| HCM LOS | C | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT | |
| Capacity (veh/h) | - | - | 368 | 1146 | - | |
| HCM Lane V/C Ratio | - | - | 0.136 | 0.005 | - | |
| HCM Control Delay (s) | - | - | 16.3 | 8.2 | 0 | |
| HCM Lane LOS | - | - | C | A | A | |
| HCM 95th %tile Q(veh) | - | - | 0.5 | 0 | - | |

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.974 | | | 0.850 | | | 0.960 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.998 | | | 0.977 | |
| Satd. Flow (prot) | 1770 | 1814 | 0 | 1770 | 1863 | 1583 | 0 | 1785 | 0 | 0 | 1820 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.998 | | | 0.977 | |
| Satd. Flow (perm) | 1770 | 1814 | 0 | 1770 | 1863 | 1583 | 0 | 1785 | 0 | 0 | 1820 | 1583 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 550 | | | 1000 | | | 300 | | | 420 | | |
| Travel Time (s) | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.978 | | | 0.850 | | | 0.938 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.998 | | | 0.979 | |
| Satd. Flow (prot) | 1770 | 1822 | 0 | 1770 | 1863 | 1583 | 0 | 1744 | 0 | 0 | 1824 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.998 | | | 0.979 | |
| Satd. Flow (perm) | 1770 | 1822 | 0 | 1770 | 1863 | 1583 | 0 | 1744 | 0 | 0 | 1824 | 1583 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 550 | | | 1000 | | | 300 | | | 420 | | |
| Travel Time (s) | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | | |

Intersection Summary

Area Type: Other

HCM 2010 Signalized Intersection Summary
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ |
| Volume (veh/h) | 152 | 233 | 49 | 39 | 426 | 192 | 9 | 130 | 58 | 92 | 99 | 188 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.91 | 0.92 | | 0.99 | 0.98 | | 0.85 | 0.95 | | 0.86 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1900 | 1863 | 1900 | 1900 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 169 | 259 | 54 | 43 | 473 | 213 | 10 | 144 | 64 | 102 | 110 | 209 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh. % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 427 | 832 | 173 | 494 | 786 | 660 | 51 | 394 | 168 | 257 | 258 | 468 |
| Arrive On Green | 0.10 | 0.57 | 0.57 | 0.42 | 0.42 | 0.42 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1774 | 1468 | 306 | 981 | 1863 | 1563 | 27 | 1144 | 487 | 575 | 750 | 1358 |
| Grp Volume(v), veh/h | 169 | 0 | 313 | 43 | 473 | 213 | 0 | 212 | 0 | 212 | 0 | 209 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1774 | 981 | 1863 | 1563 | 0 | 0 | 1325 | 0 | 1358 | 0 |
| Q Serve(g_s), s | 4.3 | 0.0 | 8.4 | 2.4 | 17.7 | 8.2 | 0.0 | 0.0 | 0.0 | 3.8 | 0.0 | 10.7 |
| Cycle Q Clear(g_c), s | 4.3 | 0.0 | 8.4 | 2.4 | 17.7 | 8.2 | 8.8 | 0.0 | 0.0 | 12.6 | 0.0 | 10.7 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 1.00 | 0.05 | | 0.29 | 0.48 | | 1.00 |
| Lane Grp Cap(c), veh/h | 427 | 0 | 1005 | 494 | 786 | 660 | 613 | 0 | 0 | 515 | 0 | 468 |
| V/C Ratio(X) | 0.40 | 0.00 | 0.31 | 0.09 | 0.60 | 0.32 | 0.36 | 0.00 | 0.00 | 0.41 | 0.00 | 0.45 |
| Avail Cap(c_a), veh/h | 427 | 0 | 1005 | 494 | 786 | 660 | 613 | 0 | 0 | 515 | 0 | 468 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 13.1 | 0.0 | 10.3 | 15.7 | 20.1 | 17.4 | 22.2 | 0.0 | 0.0 | 23.3 | 0.0 | 22.9 |
| Incr Delay (d2), s/veh | 2.7 | 0.0 | 0.8 | 0.3 | 3.4 | 1.3 | 1.6 | 0.0 | 0.0 | 2.4 | 0.0 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 0.0 | 4.3 | 0.7 | 9.8 | 3.8 | 4.3 | 0.0 | 0.0 | 4.5 | 0.0 | 4.4 |
| LnGrp Delay(d),s/veh | 15.8 | 0.0 | 11.1 | 16.1 | 23.5 | 18.7 | 23.8 | 0.0 | 0.0 | 25.8 | 0.0 | 25.9 |
| LnGrp LOS | B | | B | B | C | B | C | | | C | | C |
| Approach Vol, veh/h | 482 | | | 729 | | | | 218 | | | 421 | |
| Approach Delay, s/veh | 12.7 | | | 21.7 | | | | 23.8 | | | 25.8 | |
| Approach LOS | B | | | C | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 35.0 | | 55.0 | | 35.0 | | 13.0 | | 42.0 | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | |
| Max Green Setting (Gmax), s | 31.0 | | 51.0 | | 31.0 | | 9.0 | | 38.0 | | | |
| Max Q Clear Time (g_c+I1), s | 10.8 | | 10.4 | | 14.6 | | 6.3 | | 19.7 | | | |
| Green Ext Time (p_c), s | 3.8 | | 7.6 | | 3.5 | | 0.1 | | 6.1 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 20.5 | | | | | | | | | | | |
| HCM 2010 LOS | C | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ | ↔ | ↗ | ↘ |
| Volume (veh/h) | 115 | 406 | 71 | 68 | 527 | 112 | 9 | 100 | 93 | 89 | 119 | 170 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.83 | 0.95 | | 0.98 | 0.99 | | 0.72 | 0.93 | | 0.72 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1900 | 1863 | 1900 | 1900 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 128 | 451 | 79 | 76 | 586 | 124 | 10 | 111 | 103 | 99 | 132 | 189 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh. % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 350 | 845 | 148 | 391 | 849 | 705 | 50 | 257 | 226 | 225 | 279 | 391 |
| Arrive On Green | 0.07 | 0.57 | 0.57 | 0.46 | 0.46 | 0.46 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1774 | 1492 | 261 | 822 | 1863 | 1547 | 23 | 747 | 655 | 487 | 809 | 1136 |
| Grp Volume(v), veh/h | 128 | 0 | 530 | 76 | 586 | 124 | 224 | 0 | 0 | 231 | 0 | 189 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1753 | 822 | 1863 | 1547 | 1425 | 0 | 0 | 1296 | 0 | 1136 |
| Q Serve(g_s), s | 3.2 | 0.0 | 16.9 | 5.7 | 22.5 | 4.3 | 0.0 | 0.0 | 0.0 | 3.9 | 0.0 | 11.8 |
| Cycle Q Clear(g_c), s | 3.2 | 0.0 | 16.9 | 12.6 | 22.5 | 4.3 | 10.9 | 0.0 | 0.0 | 14.8 | 0.0 | 11.8 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 1.00 | 0.04 | | 0.46 | 0.43 | | 1.00 |
| Lane Grp Cap(c), veh/h | 350 | 0 | 993 | 391 | 849 | 705 | 533 | 0 | 0 | 503 | 0 | 391 |
| V/C Ratio(X) | 0.37 | 0.00 | 0.53 | 0.19 | 0.69 | 0.18 | 0.42 | 0.00 | 0.00 | 0.46 | 0.00 | 0.48 |
| Avail Cap(c_a), veh/h | 350 | 0 | 993 | 391 | 849 | 705 | 533 | 0 | 0 | 503 | 0 | 391 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.1 | 0.0 | 12.1 | 19.1 | 19.5 | 14.5 | 22.9 | 0.0 | 0.0 | 24.0 | 0.0 | 23.2 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 2.1 | 1.1 | 4.6 | 0.5 | 2.4 | 0.0 | 0.0 | 3.0 | 0.0 | 4.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 8.7 | 1.4 | 12.6 | 1.9 | 4.7 | 0.0 | 0.0 | 5.1 | 0.0 | 4.1 |
| LnGrp Delay(d),s/veh | 17.0 | 0.0 | 14.2 | 20.2 | 24.0 | 15.0 | 25.3 | 0.0 | 0.0 | 27.0 | 0.0 | 27.4 |
| LnGrp LOS | B | | B | C | C | B | C | | | C | | C |
| Approach Vol, veh/h | 658 | | | 786 | | | | 224 | | | 420 | |
| Approach Delay, s/veh | 14.7 | | | 22.3 | | | | 25.3 | | | 27.2 | |
| Approach LOS | B | | | C | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 35.0 | | 55.0 | | 35.0 | | 10.0 | | 45.0 | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | |
| Max Green Setting (Gmax), s | 31.0 | | 51.0 | | 31.0 | | 6.0 | | 41.0 | | | |
| Max Q Clear Time (g_c+I1), s | 12.9 | | 18.9 | | 16.8 | | 5.2 | | 24.5 | | | |
| Green Ext Time (p_c), s | 4.1 | | 11.2 | | 3.7 | | 0.0 | | 8.2 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 21.2 | | | | | | | | | | | |
| HCM 2010 LOS | C | | | | | | | | | | | |

Timing Report, Sorted By Phase
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015



| Phase Number | 2 | 4 | 6 | 7 | 8 |
|------------------------|-------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | EBL | WBTL |
| Lead/Lag | | | | Lead | Lag |
| Lead-Lag Optimize | | | | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max |
| Maximum Split (s) | 35 | 55 | 35 | 13 | 42 |
| Maximum Split (%) | 38.9% | 61.1% | 38.9% | 14.4% | 46.7% |
| Minimum Split (s) | 20 | 20 | 20 | 8 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | | 11 |
| Dual Entry | Yes | Yes | Yes | No | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 35 | 0 | 35 | 48 |
| End Time (s) | 35 | 0 | 35 | 48 | 0 |
| Yield/Force Off (s) | 31 | 86 | 31 | 44 | 86 |
| Yield/Force Off 170(s) | 20 | 75 | 20 | 44 | 75 |
| Local Start Time (s) | 0 | 35 | 0 | 35 | 48 |
| Local Yield (s) | 31 | 86 | 31 | 44 | 86 |
| Local Yield 170(s) | 20 | 75 | 20 | 44 | 75 |

Intersection Summary

| | |
|---|----------|
| Cycle Length | 90 |
| Control Type | Pretimed |
| Natural Cycle | 50 |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |

Splits and Phases: 3: 4th Street/4th Avenue & Juan Sanchez Boulevard

| | |
|--------|------|
| ϕ2 (R) | ϕ4 |
| 35 s | 55 s |
| ϕ6 (R) | ϕ8 |
| 35 s | 42 s |

Timing Report, Sorted By Phase
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015



| Phase Number | 2 | 4 | 6 | 7 | 8 |
|------------------------|-------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | EBL | WBTL |
| Lead/Lag | | | | Lead | Lag |
| Lead-Lag Optimize | | | | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max |
| Maximum Split (s) | 35 | 55 | 35 | 10 | 45 |
| Maximum Split (%) | 38.9% | 61.1% | 38.9% | 11.1% | 50.0% |
| Minimum Split (s) | 20 | 20 | 20 | 8 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | | 11 |
| Dual Entry | Yes | Yes | Yes | No | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 35 | 0 | 35 | 45 |
| End Time (s) | 35 | 0 | 35 | 45 | 0 |
| Yield/Force Off (s) | 31 | 86 | 31 | 41 | 86 |
| Yield/Force Off 170(s) | 20 | 75 | 20 | 41 | 75 |
| Local Start Time (s) | 0 | 35 | 0 | 35 | 45 |
| Local Yield (s) | 31 | 86 | 31 | 41 | 86 |
| Local Yield 170(s) | 20 | 75 | 20 | 41 | 75 |

Intersection Summary

| | |
|---|----------|
| Cycle Length | 90 |
| Control Type | Pretimed |
| Natural Cycle | 60 |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |

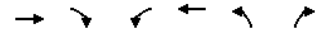
Splits and Phases: 3: 4th Street/4th Avenue & Juan Sanchez Boulevard

| | |
|--------|------|
| ϕ2 (R) | ϕ4 |
| 35 s | 55 s |
| ϕ6 (R) | ϕ8 |
| 35 s | 45 s |

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

8/24/2015



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---------------------|-------|------|-------|------|-------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | 0% | |
| Storage Length (ft) | | 0 | 85 | | 0 | 0 |
| Storage Lanes | | 0 | 1 | | 1 | 0 |
| Taper Length (ft) | | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.973 | | | | 0.955 | |
| Flt Protected | | | 0.950 | | 0.968 | |
| Satd. Flow (prot) | 1812 | 0 | 1770 | 1863 | 1722 | 0 |
| Flt Permitted | | | 0.950 | | 0.968 | |
| Satd. Flow (perm) | 1812 | 0 | 1770 | 1863 | 1722 | 0 |
| Link Speed (mph) | 25 | | 25 | 25 | 25 | |
| Link Distance (ft) | 1150 | | 550 | 316 | | |
| Travel Time (s) | 31.4 | | 15.0 | 8.6 | | |


Intersection Summary

Area Type: Other

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

8/24/2015



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---------------------|-------|------|-------|------|-------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | 0% | |
| Storage Length (ft) | | 0 | 85 | | 0 | 0 |
| Storage Lanes | | 0 | 1 | | 1 | 0 |
| Taper Length (ft) | | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.980 | | | | 0.971 | |
| Flt Protected | | | 0.950 | | 0.962 | |
| Satd. Flow (prot) | 1825 | 0 | 1770 | 1863 | 1740 | 0 |
| Flt Permitted | | | 0.950 | | 0.962 | |
| Satd. Flow (perm) | 1825 | 0 | 1770 | 1863 | 1740 | 0 |
| Link Speed (mph) | 25 | | 25 | 25 | 25 | |
| Link Distance (ft) | 1150 | | 550 | 316 | | |
| Travel Time (s) | 31.4 | | 15.0 | 8.6 | | |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
4: 1st Street & Juan Sanchez Boulevard

8/24/2015

| Intersection | | | | | | |
|--------------------------|--------|------|--------|-------|--------|-------|
| Int Delay, s/veh | 1.8 | | | | | |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Vol, veh/h | 361 | 89 | 34 | 380 | 60 | 31 |
| Conflicting Peds, #/hr | 0 | 12 | 2 | 0 | 12 | 2 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 85 | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 401 | 99 | 38 | 422 | 67 | 34 |
| Major/Minor | Major1 | | Major2 | | Minor1 | |
| Conflicting Flow All | 0 | 0 | 512 | 0 | 961 | 465 |
| Stage 1 | - | - | - | - | 463 | - |
| Stage 2 | - | - | - | - | 498 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 1053 | - | 284 | 597 |
| Stage 1 | - | - | - | - | 634 | - |
| Stage 2 | - | - | - | - | 611 | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | 1051 | - | 268 | 590 |
| Mov Cap-2 Maneuver | - | - | - | - | 398 | - |
| Stage 1 | - | - | - | - | 628 | - |
| Stage 2 | - | - | - | - | 583 | - |
| Approach | EB | | WB | | NB | |
| HCM Control Delay, s | 0 | | 0.7 | | 15.4 | |
| HCM LOS | | | | | C | |
| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT | |
| Capacity (veh/h) | 448 | - | - | 1051 | - | |
| HCM Lane V/C Ratio | 0.226 | - | - | 0.036 | - | |
| HCM Control Delay (s) | 15.4 | - | - | 8.6 | - | |
| HCM Lane LOS | C | - | - | A | - | |
| HCM 95th %tile Q(veh) | 0.9 | - | - | 0.1 | - | |

HCM 2010 TWSC
4: 1st Street & Juan Sanchez Boulevard

8/24/2015

| Intersection | | | | | | |
|--------------------------|--------|------|--------|-------|--------|-------|
| Int Delay, s/veh | 3 | | | | | |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Vol, veh/h | 537 | 94 | 28 | 546 | 108 | 30 |
| Conflicting Peds, #/hr | 0 | 38 | 10 | 0 | 38 | 10 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 85 | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 597 | 104 | 31 | 607 | 120 | 33 |
| Major/Minor | Major1 | | Major2 | | Minor1 | |
| Conflicting Flow All | 0 | 0 | 739 | 0 | 1356 | 697 |
| Stage 1 | - | - | - | - | 687 | - |
| Stage 2 | - | - | - | - | 669 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 867 | - | 165 | 441 |
| Stage 1 | - | - | - | - | 499 | - |
| Stage 2 | - | - | - | - | 509 | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | 860 | - | 149 | 423 |
| Mov Cap-2 Maneuver | - | - | - | - | 287 | - |
| Stage 1 | - | - | - | - | 483 | - |
| Stage 2 | - | - | - | - | 475 | - |
| Approach | EB | | WB | | NB | |
| HCM Control Delay, s | 0 | | 0.5 | | 27.6 | |
| HCM LOS | | | | | D | |
| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT | |
| Capacity (veh/h) | 309 | - | - | 860 | - | |
| HCM Lane V/C Ratio | 0.496 | - | - | 0.036 | - | |
| HCM Control Delay (s) | 27.6 | - | - | 9.3 | - | |
| HCM Lane LOS | D | - | - | A | - | |
| HCM 95th %tile Q(veh) | 2.6 | - | - | 0.1 | - | |

APPENDIX G

OPTION C PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics
1: 4th Avenue & Union Street

8/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | Frt 0.931 | | | 0.930 | | | 0.994 | | | 0.956 | | |
| Flt Protected | 0.983 | | | 0.996 | | | 0.968 | | | 0.985 | | |
| Satd. Flow (prot) | 0 | 1705 | 0 | 0 | 1725 | 0 | 0 | 1792 | 0 | 0 | 1754 | 0 |
| Flt Permitted | 0.983 | | | 0.996 | | | 0.968 | | | 0.985 | | |
| Satd. Flow (perm) | 0 | 1705 | 0 | 0 | 1725 | 0 | 0 | 1792 | 0 | 0 | 1754 | 0 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 300 | | | 300 | | | 880 | | | 300 | | |
| Travel Time (s) | 8.2 | | | 8.2 | | | 24.0 | | | 8.2 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics
1: 4th Avenue & Union Street

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Lane Util. 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 |
| Ped Bike Factor | Frt 0.937 | | | 0.932 | | | 0.983 | | | 0.991 | | |
| Flt Protected | 0.988 | | | 0.986 | | | 0.978 | | | 0.978 | | |
| Satd. Flow (prot) | 0 | 1724 | 0 | 0 | 1712 | 0 | 0 | 1791 | 0 | 0 | 1805 | 0 |
| Flt Permitted | 0.988 | | | 0.986 | | | 0.978 | | | 0.978 | | |
| Satd. Flow (perm) | 0 | 1724 | 0 | 0 | 1712 | 0 | 0 | 1791 | 0 | 0 | 1805 | 0 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 300 | | | 300 | | | 880 | | | 300 | | |
| Travel Time (s) | 8.2 | | | 8.2 | | | 24.0 | | | 8.2 | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 22 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 102 | 38 | 147 | 0 | 10 | 43 | 58 | 0 | 298 | 128 | 20 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 113 | 42 | 163 | 0 | 11 | 48 | 64 | 0 | 331 | 142 | 22 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|----|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 17 | 11.9 | 31.8 |
| HCM LOS | C | B | D |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 67% | 36% | 9% | 31% |
| Vol Thru, % | 29% | 13% | 39% | 37% |
| Vol Right, % | 4% | 51% | 52% | 32% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 446 | 287 | 111 | 228 |
| LT Vol | 128 | 38 | 43 | 84 |
| Through Vol | 20 | 147 | 58 | 74 |
| RT Vol | 298 | 102 | 10 | 70 |
| Lane Flow Rate | 496 | 319 | 123 | 253 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.829 | 0.556 | 0.232 | 0.441 |
| Departure Headway (Hd) | 6.022 | 6.276 | 6.758 | 6.269 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 600 | 574 | 529 | 573 |
| Service Time | 4.072 | 4.333 | 4.833 | 4.332 |
| HCM Lane V/C Ratio | 0.827 | 0.556 | 0.233 | 0.442 |
| HCM Control Delay | 31.8 | 17 | 11.9 | 14.2 |
| HCM Lane LOS | D | C | B | B |
| HCM 95th-tile Q | 8.6 | 3.4 | 0.9 | 2.2 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 16.3 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 68 | 77 | 128 | 0 | 43 | 34 | 78 | 0 | 134 | 131 | 39 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 76 | 86 | 142 | 0 | 48 | 38 | 87 | 0 | 149 | 146 | 43 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 1 |
| HCM Control Delay | 15.9 | 12.5 | 17.5 |
| HCM LOS | C | B | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, % | 44% | 25% | 28% | 45% |
| Vol Thru, % | 43% | 28% | 22% | 48% |
| Vol Right, % | 13% | 47% | 50% | 7% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 304 | 273 | 155 | 300 |
| LT Vol | 131 | 77 | 34 | 143 |
| Through Vol | 39 | 128 | 78 | 21 |
| RT Vol | 134 | 68 | 43 | 136 |
| Lane Flow Rate | 338 | 303 | 172 | 333 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.581 | 0.522 | 0.312 | 0.577 |
| Departure Headway (Hd) | 6.192 | 6.196 | 6.518 | 6.236 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 581 | 579 | 549 | 577 |
| Service Time | 4.249 | 4.254 | 4.586 | 4.293 |
| HCM Lane V/C Ratio | 0.582 | 0.523 | 0.313 | 0.577 |
| HCM Control Delay | 17.5 | 15.9 | 12.5 | 17.5 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 3.7 | 3 | 1.3 | 3.7 |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/25/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 70 | 84 | 74 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 78 | 93 | 82 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 14.2 | | |
| HCM LOS | | B | | |
| Lane | | | | |

HCM 2010 AWSC
1: 4th Avenue & Union Street

8/24/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 136 | 143 | 21 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 151 | 159 | 23 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 1 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 17.5 | | |
| HCM LOS | | C | | |
| Lane | | | | |

Lanes and Geometrics
2: 4th Avenue & Arizona Street

8/25/2015

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---------------------|-------|------|-------|------|------|-------|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | 0% |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | |
| Storage Lanes | 1 | 0 | | 0 | 0 | |
| Taper Length (ft) | 25 | | | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.979 | | 0.994 | | | |
| Flt Protected | 0.959 | | | | | 0.999 |
| Satd. Flow (prot) | 1749 | 0 | 1852 | 0 | 0 | 1861 |
| Flt Permitted | 0.959 | | | | | 0.999 |
| Satd. Flow (perm) | 1749 | 0 | 1852 | 0 | 0 | 1861 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 300 | | 420 | | | 880 |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 |

Intersection Summary

Area Type: Other

Lanes and Geometrics
2: 4th Avenue & Arizona Street

8/24/2015

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---------------------|-------|------|-------|------|------|-------|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | | 0% |
| Storage Length (ft) | 0 | 0 | | 0 | 0 | |
| Storage Lanes | 1 | 0 | | 0 | 0 | |
| Taper Length (ft) | 25 | | | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.978 | | 0.985 | | | |
| Flt Protected | 0.960 | | | | | 0.999 |
| Satd. Flow (prot) | 1749 | 0 | 1835 | 0 | 0 | 1861 |
| Flt Permitted | 0.960 | | | | | 0.999 |
| Satd. Flow (perm) | 1749 | 0 | 1835 | 0 | 0 | 1861 |
| Link Speed (mph) | 25 | | 25 | | | 25 |
| Link Distance (ft) | 300 | | 420 | | | 880 |
| Travel Time (s) | 8.2 | | 11.5 | | | 24.0 |

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

8/25/2015

| Intersection | | | | | | |
|------------------|-----|--|--|--|--|--|
| Int Delay, s/veh | 0.8 | | | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|--------------------------|------|------|------|------|------|------|
| Vol, veh/h | 30 | 5 | 419 | 21 | 3 | 249 |
| Conflicting Peds, #/hr | 6 | 8 | 0 | 6 | 8 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 6 | 466 | 23 | 3 | 277 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|----------------------|--------|-------|--------|---|--------|---|
| Conflicting Flow All | 768 | 493 | 0 | 0 | 497 | 0 |
| Stage 1 | 485 | - | - | - | - | - |
| Stage 2 | 283 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 370 | 576 | - | - | 1067 | - |
| Stage 1 | 619 | - | - | - | - | - |
| Stage 2 | 765 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 365 | 568 | - | - | 1060 | - |
| Mov Cap-2 Maneuver | 365 | - | - | - | - | - |
| Stage 1 | 615 | - | - | - | - | - |
| Stage 2 | 759 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 15.4 | 0 | 0.1 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h) | - | - | 385 | 1060 | - |
| HCM Lane V/C Ratio | - | - | 0.101 | 0.003 | - |
| HCM Control Delay (s) | - | - | 15.4 | 8.4 | 0 |
| HCM Lane LOS | - | - | C | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0 | - |

HCM 2010 TWSC
2: 4th Avenue & Arizona Street

8/24/2015

| Intersection | | | | | | |
|------------------|---|--|--|--|--|--|
| Int Delay, s/veh | 1 | | | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|--------------------------|------|------|------|------|------|------|
| Vol, veh/h | 38 | 7 | 319 | 39 | 5 | 300 |
| Conflicting Peds, #/hr | 11 | 6 | 0 | 11 | 4 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 42 | 8 | 354 | 43 | 6 | 333 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|----------------------|--------|-------|--------|---|--------|---|
| Conflicting Flow All | 731 | 391 | 0 | 0 | 409 | 0 |
| Stage 1 | 387 | - | - | - | - | - |
| Stage 2 | 344 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | 389 | 658 | - | - | 1150 | - |
| Stage 1 | 686 | - | - | - | - | - |
| Stage 2 | 718 | - | - | - | - | - |
| Platoon blocked, % | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 380 | 650 | - | - | 1146 | - |
| Mov Cap-2 Maneuver | 380 | - | - | - | - | - |
| Stage 1 | 680 | - | - | - | - | - |
| Stage 2 | 707 | - | - | - | - | - |

| Approach | WB | NB | SB |
|----------------------|------|----|-----|
| HCM Control Delay, s | 15.1 | 0 | 0.1 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h) | - | - | 406 | 1146 | - |
| HCM Lane V/C Ratio | - | - | 0.123 | 0.005 | - |
| HCM Control Delay (s) | - | - | 15.1 | 8.2 | 0 |
| HCM Lane LOS | - | - | C | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.4 | 0 | - |

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.974 | | | 0.850 | | | 0.960 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.998 | | | 0.978 | |
| Satd. Flow (prot) | 1770 | 1814 | 0 | 1770 | 1863 | 1583 | 0 | 1785 | 0 | 0 | 1822 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.998 | | | 0.978 | |
| Satd. Flow (perm) | 1770 | 1814 | 0 | 1770 | 1863 | 1583 | 0 | 1785 | 0 | 0 | 1822 | 1583 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 550 | | | 1000 | | | 300 | | | 420 | | |
| Travel Time (s) | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 100 | | 0 | 75 | | 75 | 0 | | 0 | 0 | | 40 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | 25 | | | 25 | | | 25 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.978 | | | 0.978 | | | 0.938 | | | 0.850 | | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.998 | | | 0.979 | |
| Satd. Flow (prot) | 1770 | 1822 | 0 | 1770 | 1822 | 0 | 0 | 1744 | 0 | 0 | 1824 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.998 | | | 0.979 | |
| Satd. Flow (perm) | 1770 | 1822 | 0 | 1770 | 1822 | 0 | 0 | 1744 | 0 | 0 | 1824 | 1583 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 25 | | |
| Link Distance (ft) | 550 | | | 1000 | | | 300 | | | 420 | | |
| Travel Time (s) | 15.0 | | | 27.3 | | | 8.2 | | | 11.5 | | |

Intersection Summary

Area Type: Other

HCM 2010 Signalized Intersection Summary
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/25/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Volume (veh/h) | 115 | 406 | 71 | 68 | 539 | 93 | 9 | 100 | 93 | 89 | 119 | 101 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.96 | 0.99 | | 0.97 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1900 | 1863 | 1900 | 1900 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 128 | 451 | 79 | 76 | 599 | 103 | 10 | 111 | 103 | 99 | 132 | 112 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh. % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 393 | 943 | 165 | 471 | 931 | 775 | 50 | 263 | 231 | 210 | 259 | 460 |
| Arrive On Green | 0.07 | 0.61 | 0.61 | 0.50 | 0.50 | 0.50 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1774 | 1542 | 270 | 867 | 1863 | 1550 | 28 | 878 | 771 | 509 | 863 | 1533 |
| Grp Volume(v), veh/h | 128 | 0 | 530 | 76 | 599 | 103 | 224 | 0 | 0 | 231 | 0 | 112 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1812 | 867 | 1863 | 1550 | 1676 | 0 | 0 | 1372 | 0 | 1533 |
| Q Serve(g_s), s | 2.9 | 0.0 | 14.5 | 4.8 | 21.3 | 3.2 | 0.0 | 0.0 | 0.0 | 4.3 | 0.0 | 5.0 |
| Cycle Q Clear(g_c), s | 2.9 | 0.0 | 14.5 | 9.2 | 21.3 | 3.2 | 9.6 | 0.0 | 0.0 | 13.9 | 0.0 | 5.0 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 1.00 | 0.04 | | 0.46 | 0.43 | | 1.00 |
| Lane Grp Cap(c), veh/h | 393 | 0 | 1108 | 471 | 931 | 775 | 545 | 0 | 0 | 469 | 0 | 460 |
| V/C Ratio(X) | 0.33 | 0.00 | 0.48 | 0.16 | 0.64 | 0.13 | 0.41 | 0.00 | 0.00 | 0.49 | 0.00 | 0.24 |
| Avail Cap(c_a), veh/h | 393 | 0 | 1108 | 471 | 931 | 775 | 545 | 0 | 0 | 469 | 0 | 460 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.9 | 0.0 | 9.6 | 14.9 | 16.6 | 12.1 | 25.4 | 0.0 | 0.0 | 26.8 | 0.0 | 23.8 |
| Incr Delay (d2), s/veh | 2.2 | 0.0 | 1.5 | 0.7 | 3.4 | 0.4 | 2.3 | 0.0 | 0.0 | 3.7 | 0.0 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 7.7 | 1.2 | 11.7 | 1.4 | 4.8 | 0.0 | 0.0 | 5.4 | 0.0 | 2.2 |
| LnGrp Delay(d),s/veh | 14.0 | 0.0 | 11.1 | 15.6 | 20.0 | 12.4 | 27.7 | 0.0 | 0.0 | 30.5 | 0.0 | 25.0 |
| LnGrp LOS | B | | B | B | B | B | C | | | C | | C |
| Approach Vol, veh/h | 658 | | | 778 | | | | 224 | | | 343 | |
| Approach Delay, s/veh | 11.7 | | | 18.6 | | | | 27.7 | | | 28.7 | |
| Approach LOS | B | | | B | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | | 2 | | 4 | | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | 31.0 | | 59.0 | | 31.0 | 10.0 | 49.0 | | | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | 4.0 | 4.0 | | | | |
| Max Green Setting (Gmax), s | | 27.0 | | 55.0 | | 27.0 | 6.0 | 45.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 11.6 | | 16.5 | | 15.9 | 4.9 | 23.3 | | | | |
| Green Ext Time (p_c), s | | 3.1 | | 11.7 | | 2.6 | 0.0 | 9.4 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 19.1 | | | | | | | | | | | |
| HCM 2010 LOS | B | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Volume (veh/h) | 152 | 233 | 49 | 39 | 449 | 143 | 9 | 130 | 58 | 80 | 99 | 188 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.98 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1900 | 1863 | 1900 | 1900 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 169 | 259 | 54 | 43 | 499 | 159 | 10 | 144 | 64 | 89 | 110 | 209 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh. % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 463 | 897 | 187 | 551 | 828 | 695 | 51 | 373 | 159 | 229 | 262 | 485 |
| Arrive On Green | 0.11 | 0.60 | 0.60 | 0.44 | 0.44 | 0.44 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1774 | 1495 | 312 | 1060 | 1863 | 1564 | 29 | 1200 | 511 | 549 | 843 | 1560 |
| Grp Volume(v), veh/h | 169 | 0 | 313 | 43 | 499 | 159 | 218 | 0 | 0 | 199 | 0 | 209 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1807 | 1060 | 1863 | 1564 | 1739 | 0 | 0 | 1392 | 0 | 1560 |
| Q Serve(g_s), s | 4.0 | 0.0 | 7.5 | 2.1 | 18.3 | 5.7 | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 9.6 |
| Cycle Q Clear(g_c), s | 4.0 | 0.0 | 7.5 | 2.1 | 18.3 | 5.7 | 8.8 | 0.0 | 0.0 | 11.4 | 0.0 | 9.6 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 1.00 | 0.05 | | 0.29 | 0.45 | | 1.00 |
| Lane Grp Cap(c), veh/h | 463 | 0 | 1084 | 551 | 828 | 695 | 583 | 0 | 0 | 491 | 0 | 485 |
| V/C Ratio(X) | 0.36 | 0.00 | 0.29 | 0.08 | 0.60 | 0.23 | 0.37 | 0.00 | 0.00 | 0.41 | 0.00 | 0.43 |
| Avail Cap(c_a), veh/h | 463 | 0 | 1084 | 551 | 828 | 695 | 583 | 0 | 0 | 491 | 0 | 485 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.8 | 0.0 | 8.7 | 14.5 | 19.0 | 15.5 | 24.4 | 0.0 | 0.0 | 25.0 | 0.0 | 24.7 |
| Incr Delay (d2), s/veh | 2.2 | 0.0 | 0.7 | 0.3 | 3.2 | 0.8 | 1.8 | 0.0 | 0.0 | 2.5 | 0.0 | 2.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 3.9 | 0.7 | 10.0 | 2.6 | 4.5 | 0.0 | 0.0 | 4.4 | 0.0 | 4.5 |
| LnGrp Delay(d),s/veh | 14.0 | 0.0 | 9.4 | 14.8 | 22.2 | 16.2 | 26.2 | 0.0 | 0.0 | 27.5 | 0.0 | 27.4 |
| LnGrp LOS | B | | A | B | C | B | C | | | C | | C |
| Approach Vol, veh/h | 482 | | | 701 | | | | 218 | | | 408 | |
| Approach Delay, s/veh | 11.0 | | | 20.4 | | | | 26.2 | | | 27.5 | |
| Approach LOS | B | | | C | | | | C | | | C | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | | 2 | | 4 | | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | 32.0 | | 58.0 | | 32.0 | 14.0 | 44.0 | | | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | 4.0 | 4.0 | | | | |
| Max Green Setting (Gmax), s | | 28.0 | | 54.0 | | 28.0 | 10.0 | 40.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 10.8 | | 9.5 | | 13.4 | 6.0 | 20.3 | | | | |
| Green Ext Time (p_c), s | | 3.3 | | 7.6 | | 3.1 | 0.2 | 6.3 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 20.2 | | | | | | | | | | | |
| HCM 2010 LOS | C | | | | | | | | | | | |

Timing Report, Sorted By Phase
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/25/2015



| Phase Number | 2 | 4 | 6 | 7 | 8 |
|------------------------|-------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | EBL | WBTL |
| Lead/Lag | | | | Lead | Lag |
| Lead-Lag Optimize | | | | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max |
| Maximum Split (s) | 31 | 59 | 31 | 10 | 49 |
| Maximum Split (%) | 34.4% | 65.6% | 34.4% | 11.1% | 54.4% |
| Minimum Split (s) | 20 | 20 | 20 | 8 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | | 11 |
| Dual Entry | Yes | Yes | Yes | No | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 31 | 0 | 31 | 41 |
| End Time (s) | 31 | 0 | 31 | 41 | 0 |
| Yield/Force Off (s) | 27 | 86 | 27 | 37 | 86 |
| Yield/Force Off 170(s) | 16 | 75 | 16 | 37 | 75 |
| Local Start Time (s) | 0 | 31 | 0 | 31 | 41 |
| Local Yield (s) | 27 | 86 | 27 | 37 | 86 |
| Local Yield 170(s) | 16 | 75 | 16 | 37 | 75 |

Intersection Summary

| | |
|---|----------|
| Cycle Length | 90 |
| Control Type | Pretimed |
| Natural Cycle | 60 |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |

Splits and Phases: 3: 4th Street/4th Avenue & Juan Sanchez Boulevard

| | |
|--------|------|
| ø2 (R) | ø4 |
| 31 s | 59 s |
| ø6 (R) | ø8 |
| 31 s | 49 s |

Timing Report, Sorted By Phase
3: 4th Street/4th Avenue & Juan Sanchez Boulevard

8/24/2015



| Phase Number | 2 | 4 | 6 | 7 | 8 |
|------------------------|-------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | EBL | WBTL |
| Lead/Lag | | | | Lead | Lag |
| Lead-Lag Optimize | | | | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max |
| Maximum Split (s) | 32 | 58 | 32 | 14 | 44 |
| Maximum Split (%) | 35.6% | 64.4% | 35.6% | 15.6% | 48.9% |
| Minimum Split (s) | 20 | 20 | 20 | 8 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | | 11 |
| Dual Entry | Yes | Yes | Yes | No | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 32 | 0 | 32 | 46 |
| End Time (s) | 32 | 0 | 32 | 46 | 0 |
| Yield/Force Off (s) | 28 | 86 | 28 | 42 | 86 |
| Yield/Force Off 170(s) | 17 | 75 | 17 | 42 | 75 |
| Local Start Time (s) | 0 | 32 | 0 | 32 | 46 |
| Local Yield (s) | 28 | 86 | 28 | 42 | 86 |
| Local Yield 170(s) | 17 | 75 | 17 | 42 | 75 |

Intersection Summary

| | |
|---|----------|
| Cycle Length | 90 |
| Control Type | Pretimed |
| Natural Cycle | 55 |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |

Splits and Phases: 3: 4th Street/4th Avenue & Juan Sanchez Boulevard

| | |
|--------|------|
| ø2 (R) | ø4 |
| 32 s | 58 s |
| ø6 (R) | ø8 |
| 32 s | 44 s |

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

8/25/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.973 | | | 0.850 | | | 0.955 | | | 0.865 | | |
| Flt Protected | | | | 0.950 | | | 0.968 | | | | | |
| Satd. Flow (prot) | 0 | 1812 | 0 | 1770 | 1863 | 1583 | 0 | 1722 | 0 | 0 | 0 | 1611 |
| Flt Permitted | | | | 0.950 | | | 0.968 | | | | | |
| Satd. Flow (perm) | 0 | 1812 | 0 | 1770 | 1863 | 1583 | 0 | 1722 | 0 | 0 | 0 | 1611 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 30 | | |
| Link Distance (ft) | 1150 | | | 550 | | | 316 | | | 400 | | |
| Travel Time (s) | 31.4 | | | 15.0 | | | 8.6 | | | 9.1 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

4: 1st Street & Juan Sanchez Boulevard

8/24/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 90 | 0 | 0 | 85 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. 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 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | 0.980 | | | 0.850 | | | 0.971 | | | 0.865 | | |
| Flt Protected | | | | 0.950 | | | 0.962 | | | | | |
| Satd. Flow (prot) | 0 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1740 | 0 | 0 | 0 | 1611 |
| Flt Permitted | | | | 0.950 | | | 0.962 | | | | | |
| Satd. Flow (perm) | 0 | 1825 | 0 | 1770 | 1863 | 1583 | 0 | 1740 | 0 | 0 | 0 | 1611 |
| Link Speed (mph) | 25 | | | 25 | | | 25 | | | 30 | | |
| Link Distance (ft) | 1150 | | | 550 | | | 316 | | | 400 | | |
| Travel Time (s) | 31.4 | | | 15.0 | | | 8.6 | | | 9.1 | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

8/25/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 22.5 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 0 | 361 | 89 | 0 | 34 | 380 | 49 | 0 | 60 | 0 | 31 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 401 | 99 | 0 | 38 | 422 | 54 | 0 | 67 | 0 | 34 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 3 |
| HCM Control Delay | 30.1 | 19.7 | 12.5 |
| HCM LOS | D | C | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 66% | 0% | 100% | 0% | 0% | 0% |
| Vol Thru, % | 0% | 80% | 0% | 100% | 0% | 0% |
| Vol Right, % | 34% | 20% | 0% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 91 | 450 | 34 | 380 | 49 | 108 |
| LT Vol | 0 | 361 | 0 | 380 | 0 | 0 |
| Through Vol | 31 | 89 | 0 | 0 | 49 | 108 |
| RT Vol | 60 | 0 | 34 | 0 | 0 | 0 |
| Lane Flow Rate | 101 | 500 | 38 | 422 | 54 | 120 |
| Geometry Grp | 7 | 7 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.216 | 0.819 | 0.068 | 0.705 | 0.08 | 0.229 |
| Departure Headway (Hd) | 7.7 | 5.894 | 6.517 | 6.009 | 5.298 | 6.866 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 468 | 610 | 546 | 595 | 670 | 526 |
| Service Time | 5.408 | 3.676 | 4.302 | 3.794 | 3.082 | 4.572 |
| HCM Lane V/C Ratio | 0.216 | 0.82 | 0.07 | 0.709 | 0.081 | 0.228 |
| HCM Control Delay | 12.5 | 30.1 | 9.8 | 22 | 8.5 | 11.6 |
| HCM Lane LOS | B | D | A | C | A | B |
| HCM 95th-tile Q | 0.8 | 8.4 | 0.2 | 5.7 | 0.3 | 0.9 |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

8/24/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 44.4 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 0 | 537 | 94 | 0 | 28 | 449 | 19 | 0 | 108 | 0 | 30 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 597 | 104 | 0 | 31 | 499 | 21 | 0 | 120 | 0 | 33 |
| Number of Lanes | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|----|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 1 | 1 | 3 |
| HCM Control Delay | 62 | 34.7 | 14.8 |
| HCM LOS | F | D | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 78% | 0% | 100% | 0% | 0% | 0% |
| Vol Thru, % | 0% | 85% | 0% | 100% | 0% | 0% |
| Vol Right, % | 22% | 15% | 0% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 138 | 631 | 28 | 449 | 19 | 69 |
| LT Vol | 0 | 537 | 0 | 449 | 0 | 0 |
| Through Vol | 30 | 94 | 0 | 0 | 19 | 69 |
| RT Vol | 108 | 0 | 28 | 0 | 0 | 0 |
| Lane Flow Rate | 153 | 701 | 31 | 499 | 21 | 77 |
| Geometry Grp | 7 | 7 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.341 | 1 | 0.059 | 0.869 | 0.033 | 0.158 |
| Departure Headway (Hd) | 8 | 6.19 | 6.772 | 6.272 | 5.572 | 7.417 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 449 | 589 | 530 | 579 | 643 | 483 |
| Service Time | 5.741 | 3.946 | 4.505 | 4.005 | 3.305 | 5.167 |
| HCM Lane V/C Ratio | 0.341 | 1.19 | 0.058 | 0.862 | 0.033 | 0.159 |
| HCM Control Delay | 14.8 | 62 | 9.9 | 37.3 | 8.5 | 11.6 |
| HCM Lane LOS | B | F | A | E | A | B |
| HCM 95th-tile Q | 1.5 | 14.7 | 0.2 | 9.7 | 0.1 | 0.6 |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

8/25/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 0 | 0 | 108 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 120 |
| Number of Lanes | 0 | 0 | 0 | 1 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 11.6 | | |
| HCM LOS | | B | | |
| Lane | | | | |

HCM 2010 AWSC
4: 1st Street & Juan Sanchez Boulevard

8/24/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 0 | 0 | 69 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 77 |
| Number of Lanes | 0 | 0 | 0 | 1 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 1 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 1 | | |
| HCM Control Delay | | 11.6 | | |
| HCM LOS | | B | | |
| Lane | | | | |



10th Ave. at Juan Sanchez Blvd.

Traffic Impact Analysis and
Traffic Signal Needs Assessment

San Luis, Arizona

September 2015

CivTech Project No. 15-870

Prepared For:

Core Engineering Group, PLLC
200 East 16th Street, Suite 150
Yuma, Arizona 85364

For Submittal to:

City of San Luis

Prepared By:



10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

10TH AVENUE AT JUAN SANCHEZ BOULEVARD TRAFFIC IMPACT ANALYSIS AND TRAFFIC SIGNAL NEEDS ASSESSMENT

San Luis, Arizona

Prepared for:

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City of San Luis

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Prepared: September 2015
CivTech Project No. 15-870

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EXECUTIVE SUMMARY

This report documents a traffic impact study and a traffic signal needs assessment performed for the intersection of 10th Avenue and Juan Sanchez. The intersection is the primary access to two Gadsden Elementary School District schools; Harvest Preparatory Academy, a publicly-funded, charter elementary school; and two residential subdivisions. This study was prompted in part by the ongoing consolidation and proposed expansion of Harvest Prep. In the absence of any TIA guidelines having been formally adopted by the City of San Luis, CivTech prepared this study in conformance with the City of Yuma's traffic impact study guidelines as outlined in Yuma Standard No. 2-100 and detailed in separate *Traffic Impact Study Guidelines* dated September 20, 2006. These guidelines recommend that text be kept to a minimum.

The following conclusions are documented in this study:

- ◆ The AM and PM peak hour intersection level of service analyses reveal that all study movements currently operate at overall LOS C or better during the peak hours under the existing traffic volumes and traffic controls with the exception of the northbound through/right southbound shared movements, which currently operates at LOS F during the AM peak hour with average control delays of 59.6 and 76.7 seconds, respectively. With simulated winter volumes, that is, with the Juan Sanchez Boulevard through movements recorded in May increased by a seasonal factor of 20%, the results are generally similar, with the corresponding delays increasing to 69.7 and 78.8 seconds. In terms of volume-to-capacity (V/C) ratio, the existing conditions show the southbound approach to be operating during the AM peak hour at just slightly over capacity with a V/C ratio of 1.098.
- ◆ Harvest Prep Academy intends to relocate the first existing driveway north of Juan Sanchez Boulevard to the Plaza Riedel on the west side of 10th Avenue to the south approximately 100 feet. The new location, approximately 300 feet (on center) north of Juan Sanchez Boulevard, exceeds the 150-foot minimum face-of-curb to edge-of-driveway spacing required for the first driveway along a collector roadway per City of Yuma Construction Standard Detail Drawing No. 3-250.
- ◆ The current consolidation and expansion of the Harvest Prep Academy is anticipated to generate an additional 292 trips daily with 98 trips (54 in/44 out) occurring during the AM peak hour, 38 trips (19 in/19 out) occurring during the PM peak hour, and 70 (31 in/39 out) during the school afternoon peak hour (school release time) net of a reduction to account for approximately ten percent of the students walking to school from nearby neighborhoods. At its planned maximum enrollment, Harvest Prep Academy is anticipated to generate an additional 852 trips daily with 284 trips (156 in/128 out) occurring during the AM peak hour, 111 trips (54 in/57 out) occurring during the PM peak hour, and 202 (89 in/113 out) during the school afternoon peak hour (school release time). Thus, with respect to current levels of trips, the total number of trips over current levels could eventually total 1,144 additional trips daily with 382 more (210 in/172 out) occurring during the AM peak hour, 149 more (73 in/76 out) occurring during the PM peak hour, and 272 (120 in/152 out) more during the school afternoon peak hour (school release time).

- ◆ The 2016 opening year level of service reveals that, without and with the proposed and potential school expansion, that the results are similar to the existing condition. With the ultimate expansion of the school, the outbound/southbound 10th Avenue movement approaching Juan Sanchez Boulevard could operate at LOS E during the PM peak hour. The biggest difference in average control delay is expected to occur on the northbound approach, the delay of which is expected to increase from 69.7 seconds as reported earlier to 78.2 sec in 2016 with the increase in the enrollment at Harvest Prep; thereafter, it would increase to 81.2 sec by 2026 if Harvest Prep increases its enrollment further. By 2026 the average control delays without or with the additional trips generated by more Harvest Prep students for both the northbound through/right (79.7 vs. 81.2 sec) and southbound shared (78.8 vs. 81.9 sec) movements are not very different. Thus, these increases can also be attributed, in part, to the increase in regional traffic volumes on Juan Sanchez Boulevard. The V/C ratio on the southbound approach increases to 1.235 with the additional trips generated by the additional enrollment at Harvest Prep.
- ◆ The 2016 opening year and 2026 horizon year level of service analyses of the intersection of 10th Avenue and Juan Sanchez Boulevard revealed that, without and with the proposed and potential Harvest Prep expansions, a two-phase traffic signal operating with a 90-second cycle with the addition of a new southbound left turn lane would improve the overall operation of the intersection, with all of the movements operating at a good LOS B or better.
- ◆ To summarize the traffic signal needs assessment, the warrant-satisfying criteria have been met or exceeded for the peak hour warrant at the intersection of 10th Avenue and Juan Sanchez Boulevard based on current traffic volumes and numbers of school children crossing here. Since the Gadsden school district has agreed to contribute half of the cost of the signal and Harvest Prep will be required to make a further contribution to the cost of the signal, there is an incentive to install a traffic signal during the current expansion of Harvest Prep rather than wait for some future expansion that may not occur.
- ◆ No exclusive right turn lanes are warranted on any approach to the intersection of 10th Avenue and Juan Sanchez Boulevard. Three of the approaches to the intersection already provide exclusive left turn lanes. If a signal is to be installed, a southbound left turn should be provided.
- ◆ CivTech cites several reasons as justification for the City to require Harvest Prep to contribute up to one-quarter of the cost of the signal. They are detailed in the text.
- ◆ Potential queuing of up to 2,425 feet, sufficient to accommodate the current expansion to 670 students, is available; however, it is insufficient to accommodate the estimated 3,000 feet that would be required if enrollment were to be increased to 1,000 students.
- ◆ Photos from a field review and aerial photography reveal there is sidewalk along the west side of 10th Avenue for its entire length up to County 22nd Street; thus, most of the school children that may walk to school have facilities that separate them from motor vehicles. There are, however, no bicycle lanes on Juan Sanchez Boulevard or 10th Avenue to facilitate the use of bicycles. Nor does it appear, based on improvements already made at the intersection of 10th Avenue and County 22nd Street, that the ultimate cross-section of 10th Avenue will include bicycle lanes. Children bicycling to school will have to learn how to ride safely with traffic if they are to continue to do so.

- ◆ The 95th percentile queue for the southbound movement on 10th Avenue approaching Juan Sanchez Boulevard is expected to be nearly twelve vehicles with all-way stop control. With a traffic signal, which is recommended, the 50th percentile queue is less than three vehicles. Therefore, no movement restrictions at the first Plaza Reidel driveway on 10th Avenue north of Juan Sanchez Boulevard are warranted, either at its current location or, if it is eventually relocated, at its future location approximately 300 feet (on-center) north of Juan Sanchez Boulevard. Nor are restrictions warranted at the first Reidel Plaza driveway on Juan Sanchez Boulevard west of 10th Avenue, primarily because it is a driveway on the departure side of the intersection.

Based on the above conclusions, the following are recommended

- ◆ The north leg of the intersection should be widened to the east in order to provide a new 125-foot long southbound left turn lane approaching the intersection. The new pavement should extend back 125 feet from the stop bar with a minimal 80-foot long taper back to the existing edge of pavement.
- ◆ In the future, if/when Harvest Prep expands again, the school should be required by the City to provide a circulation plan showing at least 3,000 feet of queuing available before the City approves any plans for the expansion.
- ◆ A traffic signal at the intersection of 10th Avenue and Juan Sanchez Boulevard.

CivTech understands that the schedule for implementation of these improvements will be coordinated between the parties funding them, these being the City of San Luis; the developers of the two subdivisions (Comite de Bienestar, the developer of the Beinestar Apartments at 690 North 10th Avenue, and Reidel Construction), each of which have agreed to pay one-fourth of the cost of the signal); and the Harvest Preparatory Academy.

INTRODUCTION

The intersection of 10th Avenue and Juan Sanchez Boulevard in San Luis, Arizona serves as the primary access to three elementary schools. **Figure 1** is a vicinity map showing the intersection, its lane configurations and the three schools. This study was prompted by the ongoing consolidation and enrollment increase and potential future expansion of one of the schools, the Harvest Preparatory Academy, a publicly-funded charter elementary school.

PURPOSE OF REPORT AND STUDY OBJECTIVES

CivTech Inc. was retained by Core Engineering Group of Yuma to prepare this Traffic Impact Analysis and Traffic Signal Needs Assessment (TIA).

The purpose of this TIA is to analyze the impacts of the proposed expansion of Harvest Prep on the existing surrounding street system. In the absence of any TIA guidelines having been formally adopted by the City of San Luis, CivTech prepared this study in conformance with the City of Yuma's traffic impact study guidelines as outlined in Yuma Standard No. 2-100 and detailed in separate *Traffic Impact Study Guidelines* dated September 20, 2006. These guidelines recommend that text be kept to a minimum. The specific objectives of the study are:

- ◆ To determine the effect of the currently-planned expansion of Harvest Prep on 10th Avenue and on Juan Sanchez Boulevard;
- ◆ To identify any low-cost street improvements or other measures that may, where needed, mitigate the additional site-generated traffic;
- ◆ To evaluate the site access driveways and study intersection; and,
- ◆ Assess the need for a traffic control signal at the intersection of 10th Avenue and Juan Sanchez Boulevard.

An unsealed draft of this document was reviewed by City staff. CivTech received comments (see **Appendix A**) and revised this final version accordingly. Formal responses to the City comments were not prepared.

Study Area

Yuma's guidelines specify that the study area should include any roadway segments and intersections that are expected to experience 100 or more additional peak hour trips as a result of the proposed development. With the expansion of Harvest Prep to its ultimate enrollment as currently envisioned (not a certainty), there could be more than 100 additional trips on 10th Avenue and on Juan Sanchez Boulevard; thus, the scope of the study will include both of these roadways and their intersection.

Analysis Years

This study will consider two analysis scenarios: for the currently proposed consolidation and expansion of Harvest Prep and for its potential ultimate enrollment. For the first expansion, this will be assumed for the 2016-2017 school year. For the second expansion, which is currently not planned, a horizon year of 2026 will be assumed.

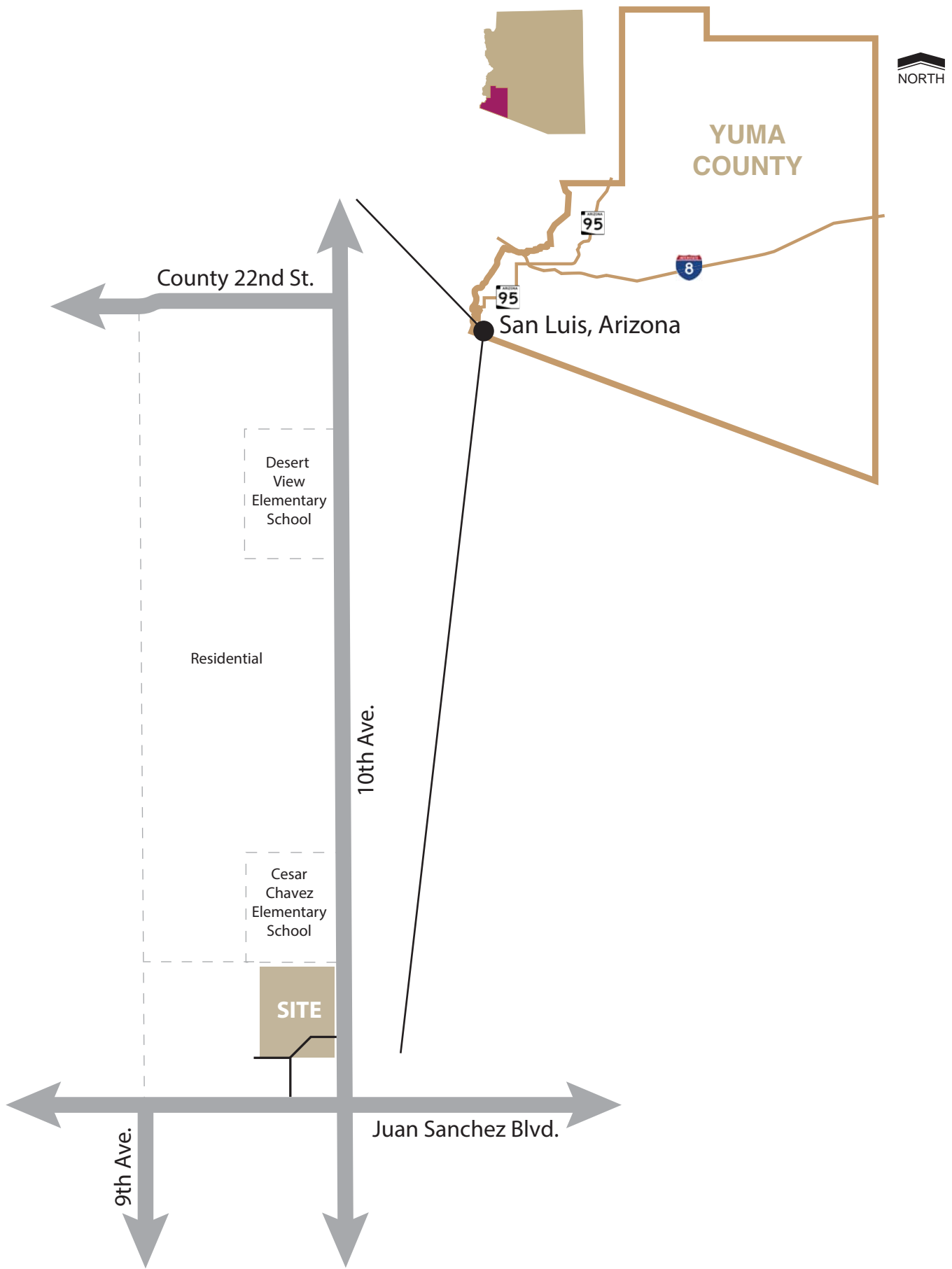


Figure 1: Vicinity Map

10th Ave. at Juan Sanchez Blvd.

EXISTING CONDITIONS

The study area consists of 10th Avenue and Juan Sanchez Boulevard and their intersection. There are three elementary schools along 10th Avenue. Two are public elementary schools of the Gadsden Elementary School District: Desert View Elementary at 1508 North 10th Avenue and Cesar Chavez Elementary at 1130 North 10th Avenue. The Harvest Prep Academy, a publicly-funded charter elementary school, is located at 1044 North 10th Avenue, on an approximately 7.4-acre parcel that is essentially within the broad limits of the Plaza Riedel, a grocery-anchored retail plaza. There is residential development surrounding them and the retail plaza, including the Bienestar Apartments at 690 North 10th Avenue and single family homes developed by Reidel Construction. (CivTech understands that the Comite de Bienestar, a not-for-profit agency that assists immigrants and constructed the apartments, and Reidel each previously agreed to fund one-quarter of the cost of a signal at 10th Avenue and Juan Sanchez Boulevard.) There is no development on the east side of 10th Avenue across from the schools; this property belongs to the Federal government and it is not expected to develop for many (twenty or more) years.

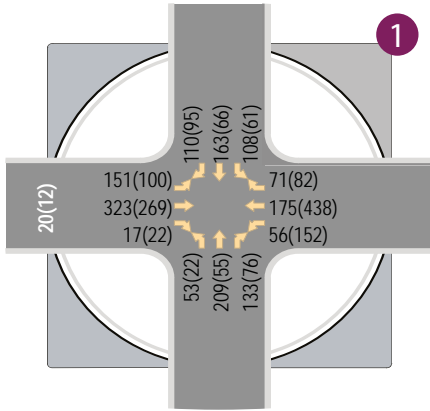
ROADWAY NETWORK AND INTERSECTION CONFIGURATION

10th Avenue is a north-south collector roadway that begins less than one mile south of Juan Sanchez Boulevard and extends nearly two miles north into the Los Alamos residential subdivision. South of Juan Sanchez Boulevard, it is striped to provide one lane in each direction with a continuous two-way left turn lane to Urtuzuastegui (or “U”) Street and then narrows to two lanes. North of Juan Sanchez Boulevard, 10th Avenue has 32 feet of pavement and is striped to provide two lanes, widening as it approaches County 22nd Street. With North of County 22nd Street, 10th Avenue the pavement is narrowed and two lanes are provided into the Los Alamos neighborhood. The posted speed limit of 10th Avenue is 25 mph.

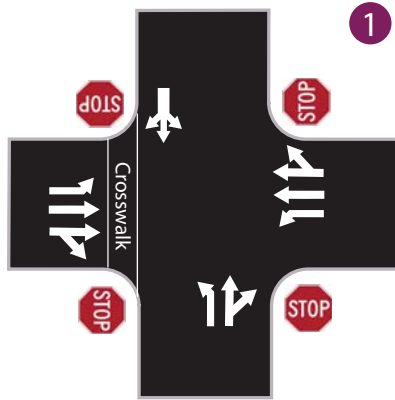
Juan Sanchez is an east-west roadway within the City of San Luis that was abandoned by the Arizona Department of Transportation (ADOT) to the City. The section of Juan Sanchez Boulevard within the City limits was at one time designated State Route 195 (SR 195), which was constructed as a bypass or an alternative for US 95 from the US-Mexico border to Yuma. SR 195 begins approximately three miles east of 10th Avenue on Juan Sanchez Boulevard. West of 10th Avenue, Juan Sanchez Boulevard has a posted speed limit of 35 mph and consists of two through lanes in each direction separated by a continuous two-way left-turn lane.

The intersection of **10th Avenue and Juan Sanchez Boulevard** is a 4-legged, all-way stop-controlled (AWSC) intersection. The east- and westbound Juan Sanchez Boulevard approaches are configured with an exclusive left turn lane, a through lane, and a shared through/right turn lane. The southbound 10th Avenue approach is a single shared lane. The northbound 10th Avenue approach is configured to provide an exclusive left turn lane, a through lane, and an exclusive right turn lane.

The existing lane configurations and traffic controls are illustrated in **Figure 2**. Photographs of existing conditions can be found **Appendix B**.



10th Ave & Juan Sanchez Blvd



LEGEND

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Traffic Signal
- Stop Sign
- Speed Limit



XX(X) - AM(PM) Peak Hour Traffic Volumes

XX(X) - AM(PM) Peak Hour Pedestrian Counts

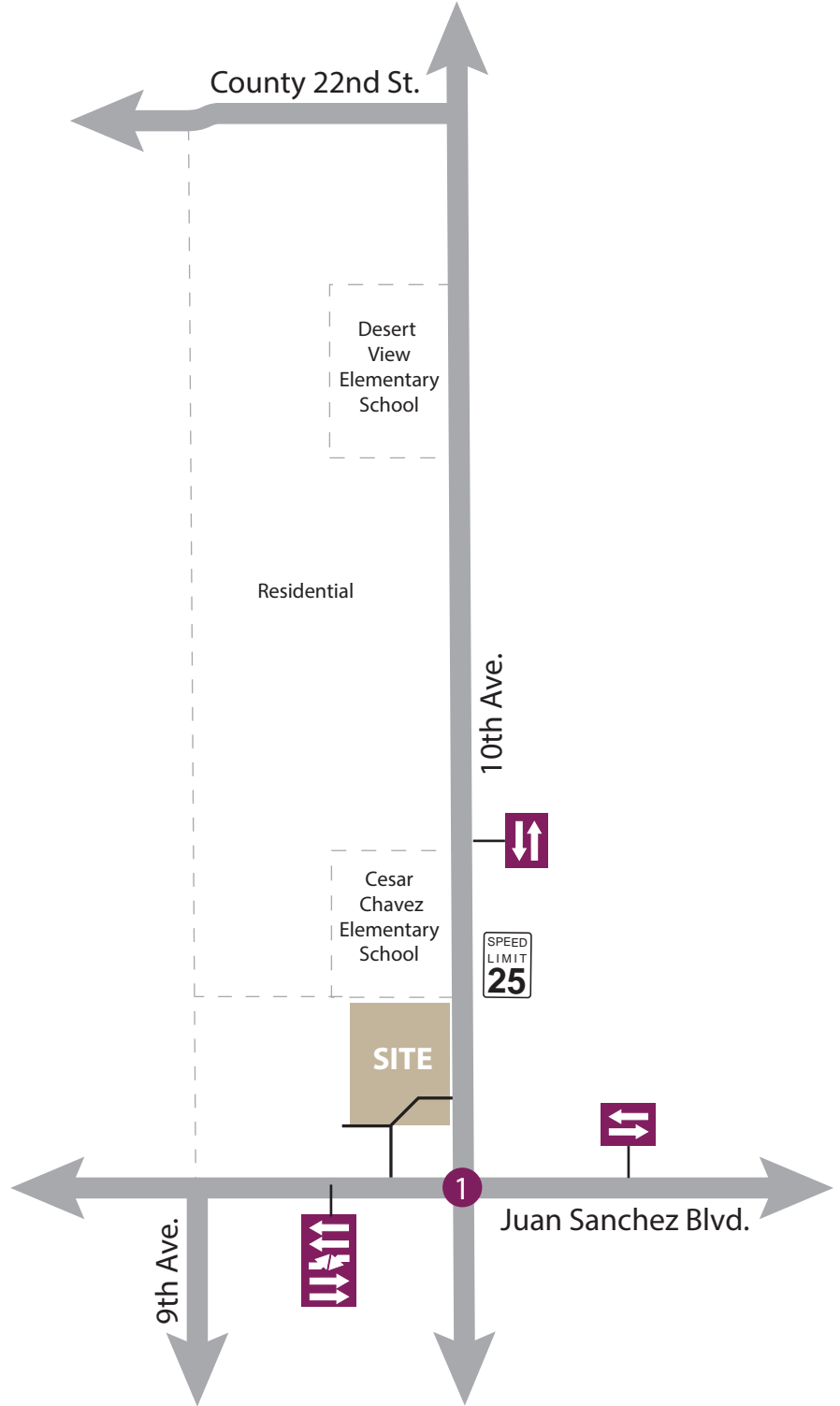


Figure 2: Existing Conditions

TRAFFIC VOLUMES

Core Engineering Group performed AM and school PM peak hour turning movement counts at the intersection of 10th Avenue and Juan Sanchez Boulevard. The counts were performed on a day when the schools were in session, Monday, May 11, 2015, from 6:30 AM to 8:30 AM and 2:30 PM to 4:30 PM. **Figure 2** also depicts the recorded AM and school PM peak hour turning movement volumes. The sheets on which the volumes were reported are provided in **Appendix B**.

Please note that, since the area attracts a substantial number of visitors and seasonal agricultural workers during the winter months and these counts were conducted during the late spring while school, as noted, was still in session. By May, winter visitors have typically returned to their permanent homes and agricultural production may yet be in full operation or nearly so; thus, in the analysis it may be prudent to consider the application of some level of adjustment to the recorded volumes. This is considered below.

Seasonal Adjustment Factor. CivTech reviewed historical traffic volume data available from the Yuma Metropolitan Planning Organization (YMPO) to estimate an appropriate adjustment factor to be applied to the existing traffic counts in order to have the capacity analysis better approximate conditions in the busier winter months. YMPO records traffic counts twice each year: in February and the following July. CivTech also reviewed recent historical vehicular traffic volumes on 10th Avenue south of Juan Sanchez Boulevard (not immediately adjacent to the schools) and on Juan Sanchez Boulevard east of US 95, which could be almost two miles to the west of 10th Avenue. A summary of the data compiled is found at the end of **Appendix B**.

YMPO includes the San Luis area in its "South Valley Subarea". The data shows that the traffic volumes recorded in the South Valley Subarea increased about six and one-half percent per year from 2011 to 2012 and from 2013 to 2014 with only a minor increase (about one-half percent) from 2012 to 2013. However, on Juan Sanchez Boulevard there was actually a drop of more than eight percent from 2012 to 2013 before a rebound of about one-third from 2013 to 2014. On 10th Avenue south of Juan Sanchez Boulevard, the 2013 winter count was only one-third of the 2012 winter count and much less than the summer count that year. It can only be speculated that the count was inaccurate for some reason or something occurred to detour drivers from 10th Avenue the day of the count. For this reason only the summer-to-winter variation on Juan Sanchez Boulevard will be applied to the recorded counts.

The summer-to-winter variations for the subarea averaged 29.31% in 2012, 19.24% in 2013, and 30.02% in 2014. For Juan Sanchez Boulevard, the average changes were 22.84% in 2012, 34.15 % in 2013, and 29.49% in 2014. The overall average variation at the intersection for the three years was 28.65%. As noted, this overall variation was calculated using February and July data and the counts were recorded in May, when most winter visitors have left, some agricultural workers may remain, and many local residents have not left for vacations (since schools are still in session). Therefore, a reduced factor of 20% to account for the seasonal variation between the busy winter season and the late spring counts will be applied to the recorded traffic volumes.

CAPACITY ANALYSIS

The concept of level-of-service (LOS) uses qualitative measures that characterize operational conditions within roadway facilities. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level-of-service represents a range of operating conditions. Levels of service for intersections are defined in terms of average delay ranges for vehicles. **Table 1** lists the level-of-service criteria for signalized and unsignalized intersections. *Please note that the actual average delays that determine the levels of service are very different for signalized and unsignalized intersections. A driver waiting an average of 55 seconds to enter an unsignalized intersection from a stop sign is considered to be encountering a LOS F, whereas the same average wait at a traffic signal is LOS D. This is noted here because, even if this existing all-way stop-controlled (AWSC) intersection operates at LOS D or LOS E, the average driver may still experience less of a delay than if a [costly] signal were provided.*

Table 1: Level-of-Service Criteria

| Level of Service | Control Delay (seconds/vehicle) | |
|------------------|---------------------------------|----------------------------|
| | Signalized Intersections | Unsignalized Intersections |
| A | ≤ 10 | ≤ 10 |
| B | > 10-20 | > 10-15 |
| C | > 20-35 | > 15-25 |
| D | > 35-55 | > 25-35 |
| E | > 55-80 | > 35-50 |
| F | > 80 | > 50 |

Source: Exhibit 18-4 and Exhibit 19-1, Highway Capacity Manual 2010

AM and PM peak hour capacity analyses were conducted for the intersection of 10th Avenue and Juan Sanchez Boulevard using the methodologies presented in the Highway Capacity Manual 2010 using Synchro traffic analysis software. The resulting LOS for the existing conditions is summarized in **Table 2**. Where the LOS is poor or failing (LOS E or F), the average control delay (in seconds) for the movement is shown. The table also includes the volume-to-capacity (V/C) ratio for the lane or approach with the highest V/C ratio. (A V/C ratio greater than 1.0 indicates the traffic volumes are more than a lane or approach can theoretically accommodate.) The worksheets for the analysis of existing (2015) conditions are included in **Appendix C**.

Table 2: Existing Peak Hour Levels-of-Service

| ID | Intersection | Traffic Control | Movement | Existing LOS/Delay May, No Adjustment | | Existing LOS/Delay 20% Adjustment Applied | |
|----|--|-----------------|--------------------------------|--|-------------------|--|-------------------|
| | | | | AM | PM | AM | PM |
| 1 | 10 th Avenue & Juan Sanchez Boulevard | All-way stop | NB left | B | B | B | B |
| | | | NB thru/right | F/59.6 | C | F/69.7 | C |
| | | | SB shared | F/76.7 | C | F/78.8 | C |
| | | | EB left | C | B | C | C |
| | | | EB thru | C | C | D | C |
| | | | EB thru/right | C | B | C | B |
| | | | WB left | C | C | C | C |
| | | | WB thru | C | C | C | D |
| | | | WB thru/right | C | C | C | C |
| | | | Overall Hi Lane V/C | E 1.053 | C 0.549 | E 1.098 | C 0.665 |

The AM and PM peak hour intersection level of service analyses summarized in **Table 2** reveal that all study movements currently operate at overall LOS C or better during the peak hours under the existing traffic volumes and traffic controls with the exception of the northbound through/right southbound shared movements, which currently operates at LOS F during the AM peak hour with average control delays of 59.6 and 76.7 seconds, respectively. With simulated winter volumes, that is, with the Juan Sanchez Boulevard through movements recorded in May increased by a seasonal factor of 20%, the results are generally similar, with the corresponding delays increasing to 69.7 and 78.8 seconds.

PROPOSED DEVELOPMENT

This study was prompted in part by a consolidation and expansion of the Harvest Prep Academy current headquartered at 1044 North 10th Avenue and occupying several storefronts in the Plaza Riedel. The school has an enrollment of 530 students and provides 10 grades, Pre-K (4-year olds), Kindergarten and grades 1 through 8. Harvest Prep operates a high school in Yuma and buses students there from San Luis. A Harvest Prep high school will likely be opened in San Luis; however, it is expected at a site well away from the elementary school site and is not considered to be part of this proposed expansion.

CivTech contacted Mr. Dave Garrison of MJY & Company, a developer of charter schools. Mr. Garrison explained that the school has been occupying store fronts as noted. The company purchased a parcel of nearly 7½ acres (Yuma County Assessor parcel number 776-28-215) and is currently in the process of constructing a facility that will provide 18 classrooms, three more than their current capacity, with a total enrollment of approximately 650 students by the 2016-17 school year, a net increase of an estimated 120 students. This is the first and only certain expansion that will occur. The ultimate expansion, could be to 30 classrooms or up to three classrooms for each grade, with a total enrollment approaching 1,000 students. The date of the ultimate expansion is unknown, since it would occur only in response to market conditions; a horizon year of 2026 is assumed for this ultimate expansion.

No site plan was provided for the current consolidation/expansion. It is expected that the ultimate expansion would be completed on the same site. No new accesses to the parcel would be necessary; however, CivTech understands that the first existing driveway north of Juan Sanchez Boulevard to the Plaza Riedel on the west side of 10th Avenue could be relocated to the south approximately 100 feet, although aerial photography from March 2015 shows the new school building, but no change in the location of the driveway or any indication that it was to be relocated. The proposed new location, approximately 300 feet (on center) north of Juan Sanchez Boulevard, exceeds the 150-foot minimum face-of-curb to edge-of-driveway spacing required for the first driveway along a collector roadway per City of Yuma Construction Standard Detail Drawing No. 3-250.

CivTech was told that the school, since it is located within a retail plaza, has sufficient parking and circulation for student drop-off in the morning and for pick-up in the afternoon. In addition, parents carpool and more than ten percent of the students walk to school from adjacent neighborhoods. However, since the City raised the issues of site circulation and on-site queuing in a comment on the draft of this study, these will be subsequently addressed.

Subsequent to this, CivTech learned that Harvest Prep was issued a permit by the City for their current headquarters and that, after that permit was issued, the retail space was rented to provide classrooms above and beyond what was approved in the permit. When CivTech suggested that the impacts of the trips generated by the retail space-cum-classrooms would have been considered in a traffic study done for the retail plaza, CivTech learned that there was no such study and that the City has no development or impact fees. Thus, in effect, all of the trips generated by Harvest Prep can be considered new trips for purposes of assessing their impacts. In terms of trip generation (see next section), however, the only “new” trips are those due to the charter school’s current

consolidation and expansion efforts, since the trips for 530 of the students are already on the adjacent roadways and accounted for in the turning movements recorded in May.

SITE TRIP GENERATION

The Institute of Transportation Engineers (ITE) periodically publishes its *Trip Generation Manual*, which contains trip generation and other related data for a variety of different land uses. Currently in its 9th edition, the data includes average rates and equations to which the size or capacity of a land use can be applied to yield an estimate of the trips generated by that land use for a typical day or for peak hours during the day.

The *Trip Generation Manual* provides information for daily and peak hour trips for public and private school, not for charter schools, which, while publicly-funded, are considered to be more akin to that of a private school because many or most charter schools do not provide busing for their students. CivTech compiled data for several charter schools in the Phoenix metropolitan area and developed average trip generation rates for the AM peak hour and for the schools’ PM peak hour.

The average trip generation rates for a Private School (K-8) (Land Use Code 534) as published in the *Trip Generation Manual* are 0.90 and 0.60 trips per student for the AM and school PM peak hours, respectively. CivTech will use its own value of 0.65 for the school PM peak hour rate, which is eight percent higher than the published rates. CivTech increased the daily per-student trip generation rates by almost 10% from 2.48 to 2.70 and more than doubled the PM peak hour (of adjacent street traffic) rate from 0.17 to 0.35. Since, as noted, more than ten percent of the students currently live in the residential areas immediately surrounding the school and the trip generation reflect a ten percent reduction in vehicle trips to account for students walking to the school from those nearby neighborhoods.

Since the turning movement counts recorded in May include trips generated by Harvest Prep and the other schools on 10th Avenue, **Table 3** presents detailed trip generation calculations for the potential net increases of 120 students for the current expansion project and for an increase of another 330 students (up to a total enrollment of 1,000 students) if there is an ultimate increase that provides three classrooms per grade.

Table 3 – Proposed Trip Generation

| Land Use | ITE LUC | ITE Land Use Name | Quantity | Units | AM Distribution | | PM Distribution | | Midday Distribution | |
|--------------------|---------|----------------------|----------|----------|-----------------|-----|-----------------|-----|---------------------|-----|
| | | | | | In | Out | In | Out | In | Out |
| Current Expansion | n/a | Charter School (K-8) | 120 | Students | 55% | 45% | 49% | 51% | 44% | 56% |
| Future Expansion | n/a | Charter School (K-8) | 330 | Students | 55% | 45% | 49% | 51% | 44% | 56% |
| Totals to Ultimate | | | 470 | Students | | | | | | |

| Land Use | ADT | | AM Peak Hour | | | PM Peak Hour of Street | | | PM Peak Hour of Generator | | | | | |
|--------------------|--------------|-------|--------------|-----|-----|------------------------|--------------|----|---------------------------|-------|--------------|-----|-----|-------|
| | Average Rate | Total | Average Rate | In | Out | Total | Average Rate | In | Out | Total | Average Rate | In | Out | Total |
| Current Expansion | 2.70 | 292 | 0.90 | 54 | 44 | 98 | 0.35 | 19 | 19 | 38 | 0.64 | 31 | 39 | 70 |
| Future Expansion | 2.70 | 852 | 0.90 | 156 | 128 | 284 | 0.35 | 54 | 57 | 111 | 0.64 | 89 | 113 | 202 |
| Totals to Ultimate | | 1,144 | | 210 | 172 | 382 | | 73 | 76 | 149 | | 120 | 152 | 272 |

A review of the results of the trip generation that will be used in this analysis presented in **Table 3** reveals that the current consolidation and expansion of the Harvest Prep Academy

is anticipated to generate an additional 292 trips daily with 98 trips (54 in/44 out) occurring during the AM peak hour, 38 trips (19 in/19 out) occurring during the PM peak hour, and 70 (31 in/39 out) during the school afternoon peak hour (school release time).

Should the school expand further in the future, at its planned maximum enrollment, Harvest Prep Academy is anticipated to generate an additional 852 trips daily with 284 trips (156 in/128 out) occurring during the AM peak hour, 111 trips (54 in/57 out) occurring during the PM peak hour, and 202 (89 in/113 out) during the school afternoon peak hour (school release time).

With respect to current levels of trips, the total number of trips over current levels could eventually total 1,144 additional trips daily with 382 more (210 in/172 out) occurring during the AM peak hour, 149 more (73 in/76 out) occurring during the PM peak hour, and 272 more (120 in/152 out) during the school afternoon peak hour (school release time).

SITE TRIP DISTRIBUTION

A single trip distribution pattern was assumed for this study relative to the school use. Since detailed socioeconomic data is not generally available for the San Luis area, the relative density of development visible in aerial photography of the area was used as a basis to estimate trip distribution. The directional distribution was adjusted to the roadway network based on the major travel routes within the study area. The resulting trip distribution is shown in **Table 4** and depicted in **Figure 3**.

Table 4 – Trip Distribution by Direction

| To/From | Distribution |
|---------------------------------|---------------------|
| North via 10 th Ave. | 10% |
| South via 10 th Ave. | 30% |
| West via Juan Sanchez | 60% |
| TOTAL | 100% |

BACKGROUND TRAFFIC

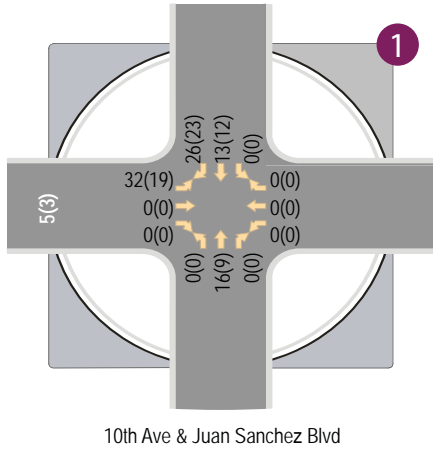
In addition to the seasonal adjustment factor, the application of an annual growth factor to account for regional growth was considered. A review of projected 2030 traffic volumes on SR 195 available from ADOT, revealed an annual growth rate of under two percent per year through 2030 on SR 195 east of San Luis. CivTech, therefore, assumed a modest growth rate of 2 percent from 2015 to the opening year 2016. In addition to the seasonal adjustment factor, a growth factor of 1.020 was thus applied to the turning movements recorded at the study intersections to estimate the turning movements for the opening year (2016). For the 2026 horizon year, a growth factor of 1.24 (=1.02¹¹) was applied. The background traffic volumes for the 2016 opening year and 2026 assumed horizon year are depicted in **Figure 4**.

FUTURE TOTAL TRAFFIC

Anticipated total traffic volumes for the 2016 and 2026 analysis years were computed by adding the site generated traffic to the background traffic expected in 2016 and 2026. Total traffic volumes for 2016 and 2026 are also shown in **Figure 4**.

2016

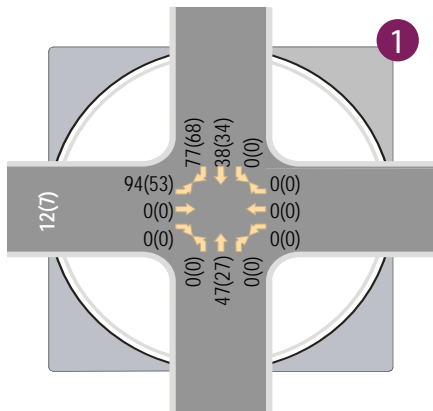
Proposed Expansion



10th Ave & Juan Sanchez Blvd

2026

Potential Build-Out



10th Ave & Juan Sanchez Blvd

LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

XX(XX) - AM(PM) Peak Hour Pedestrian Counts

XX% - Percentage Trip Distribution

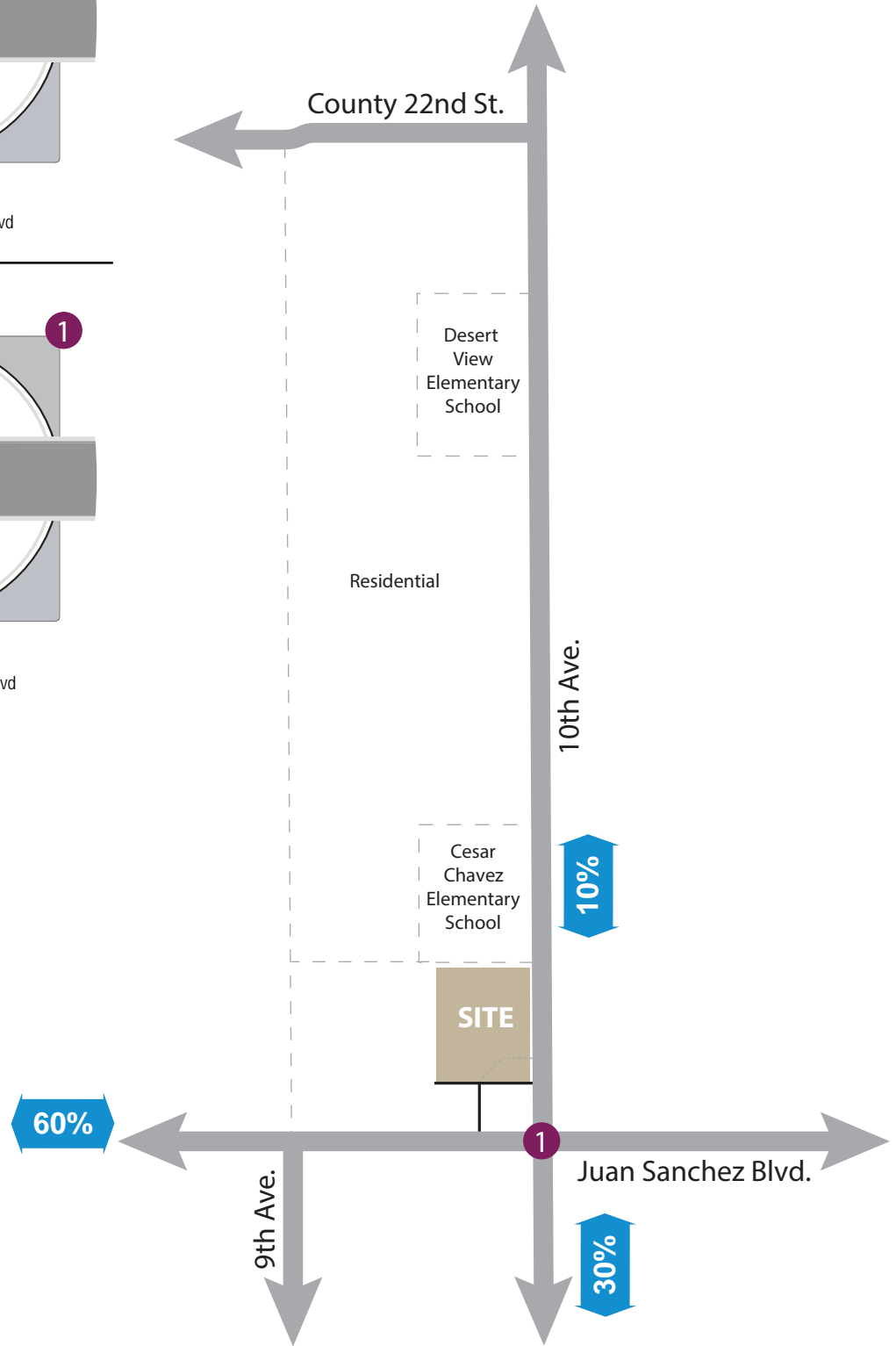
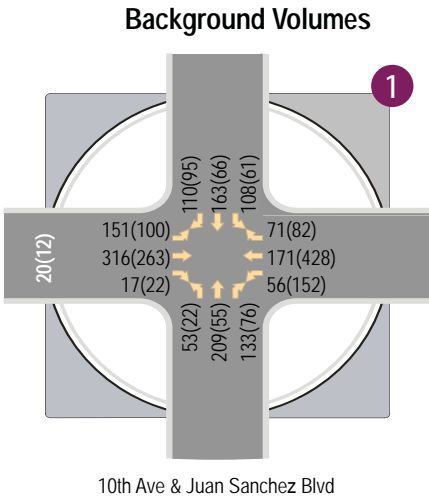


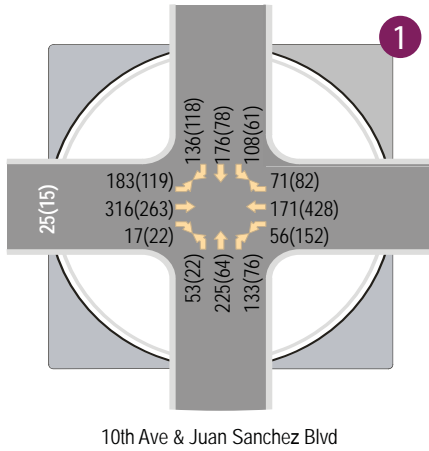
Figure 3: Site Volumes/Trip Distribution

2016

Proposed Expansion

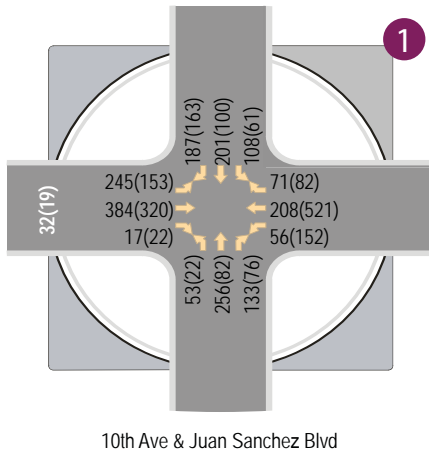
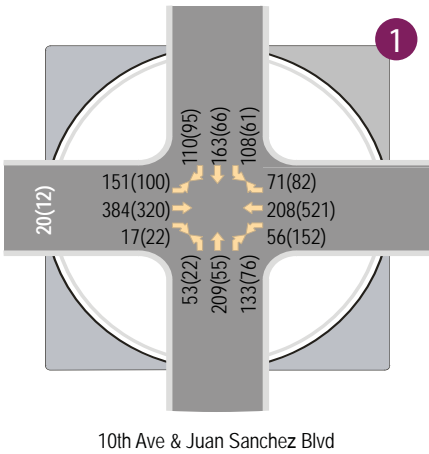


Total Volumes



2026

Potential Build-Out



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes
 XX(XX) - AM(PM) Peak Hour Pedestrian Counts

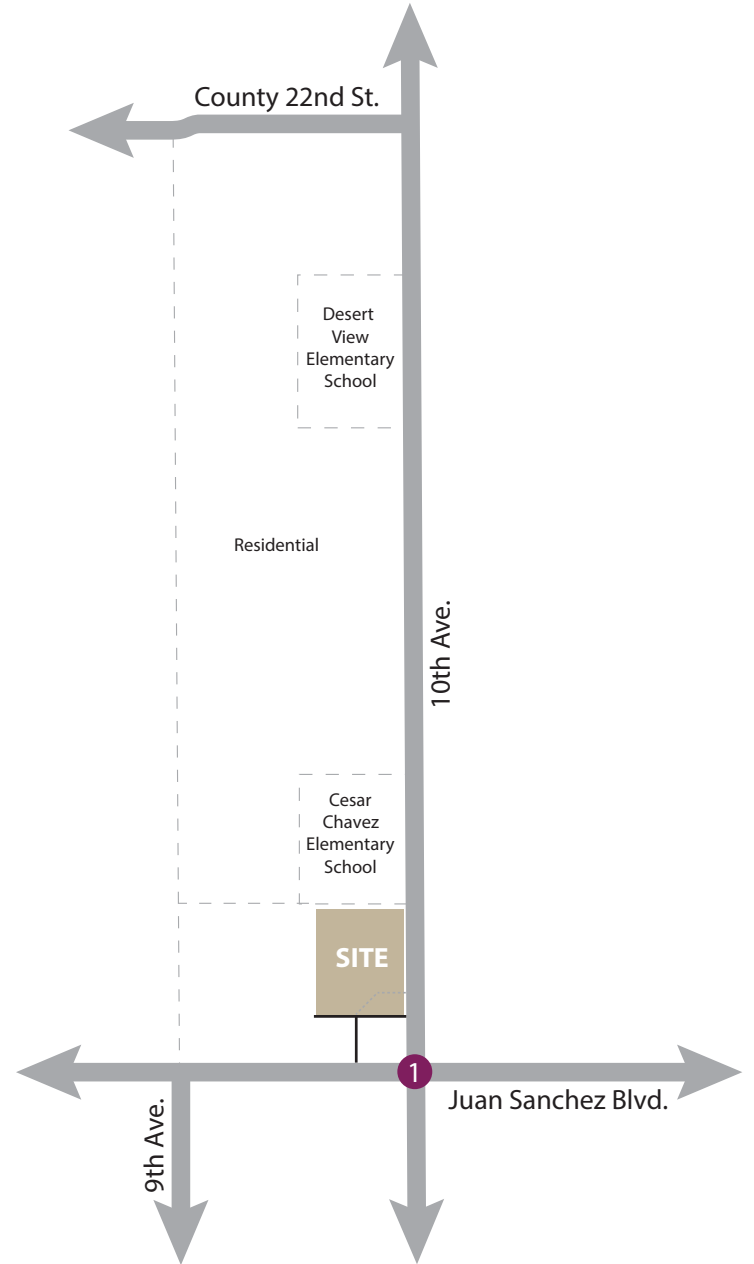


Figure 4: Background and Total Volumes

LEVEL OF SERVICE ANALYSIS

Two peak hour analyses were completed for the study horizon year for each of two scenarios: one without the proposed development and one with the development. The overall intersection, approach and/or movement levels of service and V/C ratios yielded by the analysis are summarized in **Table 5**. Synchro worksheets for the 2016 and 2026 analyses are included in **Appendix D** and in **Appendix E** for 2026. To account for the seasonal adjustment of 20% plus the annual growth rate of 2% and not have it applied to the additional expected site trips (which do not change), total “growth adjustment” factors of 1.22 and 1.44, respectively, were applied *before* site trips were added into the analyses for 2016 and 2026.

Table 5: Peak Hour Levels of Service as All-Way Stop

| ID | Intersection | Traffic Control | Movement | 2016 AM(PM) LOS/Delay | | 2026 AM(PM) LOS/Delay | |
|----|--|-----------------|---------------|-----------------------|----------------------------|-----------------------------|-----------------------------|
| | | | | Background | Total | Background | Total |
| 1 | 10 th Avenue & Juan Sanchez Boulevard | All-Way Stop | NB left | B(B) | C(B) | C(B) | C(C) |
| | | | NB thru/right | F/70.8(C) | F/78.2(C) | F/79.7(C) | F/81.2(D) |
| | | | SB shared | F/79.0(C) | F/79.2(D) | F/80.8(D) | F/81.9(F/77.8) |
| | | | EB left | C(C) | D(C) | C(C) | E(C) |
| | | | EB thru | D(C) | D(C) | E(C) | E(D) |
| | | | EB thru/right | C(B) | C(C) | C(B) | C(C) |
| | | | WB left | C(C) | C(C) | C(C) | C(C) |
| | | | WB thru | C(D) | C(D) | C(D) | C(F) |
| | | | WB thru/right | C(C) | C(C) | C(C) | C(D) |
| | | | | | Overall Hi Lane V/C | E(C) 1.110(0.588) | E(C) 1.235(0.719) |

A review of the results of the 2016 opening year level of service analyses summarized in **Table 5** reveals that, without and with the proposed and potential Harvest Prep expansions, that the results are similar to the existing condition. That is, all study movements should operate at LOS C or better with the exception of the northbound through/right turn movement and the southbound shared movement in the existing configuration. In addition, with ultimate expansion of Harvest Prep, the outbound/southbound 10th Avenue movement approaching Juan Sanchez Boulevard could operate at LOS E during the PM peak hour.

The biggest difference in average control delay is expected to occur on the northbound approach, the delay of which is expected to increase from 69.7 seconds as reported earlier to 78.2 sec in 2016 with the increase in the enrollment at Harvest Prep; thereafter, it would increase to 81.2 sec by 2026 if Harvest Prep increases its enrollment further. By 2026 the average control delays without or with the additional trips generated by more Harvest Prep students for both the northbound through/right (79.7 vs. 81.2 sec) and southbound shared (78.8 vs. 81.9 sec) movements are not very different. Thus, these increases can also be attributed, in part, to the increase in regional traffic volumes on Juan Sanchez Boulevard.

In terms of V/C ratios, as shown in **Table 2**, the existing conditions already show the southbound approach to be operating during the AM peak hour at just slightly over capacity with a V/C ratio of 1.098. This increases to 1.235 with the additional trips

generated by the additional enrollment at Harvest Prep. (Please note that the theoretical or calculated capacity of an approach is not simply based on how many vehicles a lane can accommodate; at an intersection, the capacity of an approach is affected by the amount of cross-traffic. Cross-traffic on the intersecting street takes away from the time available to enter from the approach or cross it, decreasing the theoretical capacity of the approach and thereby increasing the V/C ratio in such a way that it may appear to be disproportionate to the increase in approach traffic volumes.) The AM V/C ratios and volumes are more critical in this situation because after dropping off their children, the parents join the parents from the other schools and commuters in using 10th Avenue. During the school PM peak hour, the outbound trips do not include the same level of commuter traffic.

In the event that a signal were to be warranted and installed, CivTech conducted an additional analysis of the intersection for the same scenarios assuming a two-phase signal (that is, no exclusive left turn phasing) operating with a cycle length of 90 seconds and the addition of an exclusive southbound left turn lane as suggested below. The results of these analyses are summarized in **Table 6**. The Synchro worksheets are included in their respective appendices.

Table 6: Peak Hour Levels of Service with Traffic Signal

| ID | Intersection | Traffic Control | Movement | 2016 AM(PM) LOS/Delay | | 2026 AM(PM) LOS/Delay | |
|----|--|-----------------|----------------------|-----------------------|-------------|-----------------------|-------------|
| | | | | Background | Total | Background | Total |
| 1 | 10 th Avenue & Juan Sanchez Boulevard | All-Way Stop | NB left | A(B) | B(B) | B(B) | B(B) |
| | | | NB thru/right | A(A) | A(A) | A(B) | B(B) |
| | | | SB left | B(B) | B(B) | B(B) | B(B) |
| | | | SB thru/right | A(A) | A(B) | A(B) | B(B) |
| | | | EB left | B(A) | B(A) | B(A) | B(B) |
| | | | EB thru | A(A) | B(A) | A(A) | B(A) |
| | | | EB thru/right | A(A) | B(A) | A(A) | B(A) |
| | | | WB left | B(A) | B(A) | B(A) | B(A) |
| | | | WB thru | A(A) | A(A) | A(A) | B(A) |
| | | | WB thru/right | A(A) | A(A) | A(A) | B(A) |
| | | | Overall LOS | A(A) | A(A) | A(A) | B(A) |
| | | | Average Delay | 9.3(6.8) | 10.0(7.3) | 9.7(7.0) | 12.6(8.9) |

A review of the results of the 2016 opening year and 2026 horizon year level of service analyses of the intersection of 10th Avenue and Juan Sanchez Boulevard summarized in **Table 6** reveals that, without and with the proposed and potential Harvest Prep expansions, a two-phase traffic signal operating with a 90-second cycle with the addition of a new southbound left turn lane would improve the overall operation of the intersection, with all of the movements operating at a good LOS B or better.

MITIGATION AND IMPROVEMENT ANALYSIS

TRAFFIC SIGNAL NEEDS ASSESSMENT

As noted, Yuma guidelines suggest text be minimized and the use of tables and figures to convey information be maximized. With respect to traffic signals needs, it is suggested that the study author assumes the reader/reviewer is familiar with the requirements of the *Manual on Uniform Traffic Control Devices* (MUTCD) and simply repeat verbatim the descriptions of the warrants, etc., which is often found in a full traffic control signal warrant study. This being the case, this section will consider three of the nine warrants found in the MUTCD, Warrant 3, based on peak hour volumes; Warrant 4, based on pedestrian volumes; and Warrant 5, which is considered when there is a school crossing.

Warrant 3, Peak Hour. With three schools on 10th Avenue north of Juan Sanchez Boulevard, it is likely that there is a surge of southbound traffic during either the AM or school PM peak hour as parents leave the schools after having dropped off or picked up their children. Typically applied in special circumstances (such as an office or factory where outbound trips peak during a very short period of time at the end of a shift or work day), if the number of vehicles on a minor street approach exceeds a certain number determined in part on the volume on the major street, a signal is warranted. Based on the unadjusted volumes recorded in May, that is, without the seasonal factor applied to the through volumes on Juan Sanchez Boulevard, this intersection already warrants a traffic signal for at least one hour per day; therefore, unless there is a decrease in traffic volumes—an unlikely scenario—a signal will be warranted with future traffic volumes. Thus, since the warrant-satisfying criteria have been met or exceeded, and, as CivTech was told, the Gadsden school district has agreed to contribute half of the cost of the signal, there is an incentive to install a traffic signal sooner rather than later, especially since school children cross here (see additional warrant discussions below).

Warrant 4, Pedestrian Volume. Depending on the volume on Juan Sanchez Boulevard, a signal may be warranted for reasons of as few as 93 pedestrians crossing during a peak hour. The pedestrian counts recorded in May 2015 show a maximum of 20 pedestrian per hour crossing Juan Sanchez Boulevard, which, presumably, are not just students of Harvest Prep and their parents. Even if 18 additional parents and students cross (attributed to and reflective of a near-doubling of the Harvest Prep enrollment from 530 to a potential ultimate enrollment of 1,000) each morning peak hour, the new total is still well short of satisfying the pedestrian peak hour warrant; nor is the four-hour warrant, which requires only four hours with 75 crossings per hour, met.

Warrant 5, School Crossing. This warrant is met when there are a minimum of 20 schoolchildren crossing during the peak hour and the number of adequate gaps in the traffic stream during the period when the schoolchildren are using the crossing is less than the number of minutes in the same period. CivTech did not conduct a study of the frequency and adequacy of gaps in the traffic stream along Juan Sanchez Boulevard. Such a study was not considered necessary because the intersection is all-way stop-controlled, creating gaps in the traffic and allowing schoolchildren and others to cross. The traffic counts recorded for CivTech did not distinguish between schoolchildren and other pedestrians; however, with a current maximum pedestrian crossing volume of 20 pedestrians per hour and three nearby schools, it could be assumed that the minimum peak hour volume of 20 crossing schoolchildren will be met.

Analysis. To summarize the above assessments, the warrant-satisfying criteria have been met or exceeded for the peak hour warrant at the intersection of 10th Avenue and Juan Sanchez Boulevard based on current traffic volumes and numbers of school children crossing here. Since the two developers (Comite de Bienestar and Reidel Construction) have agreed to contribute half of the cost of the signal (one-quarter each) and Harvest Prep will be required to make a further contribution to the cost of the signal, there is an incentive to install a traffic signal during the current expansion of Harvest Prep rather than wait for some future expansion that may not occur.

CivTech cites the following reasons as justification for the City to require Harvest Prep to contribute one-quarter of the cost of the signal (or to at least start its negotiations with Harvest Prep at that level):

- Three of the corners of the intersection remain undeveloped, the two to the east indefinitely due to their being Federally-owned. It is not known if and when the southwest corner, which is in unincorporated Yuma County, may develop and whether the City can enforce any requirements or fees on the owner/developer in the future.
- Neither Plaza Riedel nor Harvest Prep was previously subjected to impact fees.
- The two developers are contributing one-half of the cost of the signal. Essentially, each is contributing one-quarter of the cost of the signal for residents of its development.
- Harvest Prep, as the primary occupant of the retail plaza, represents, in effect, the entire retail plaza, which, as the occupier of one corner of the intersection, would have been asked to contribute one-quarter of the cost of the signal.

AUXILIARY LANES

CivTech was asked to determine if additional lanes were warranted at the intersection. Three of the approaches to the intersection already provide exclusive left turn lanes. Maximum right turning volumes of under 190 right turns per hour (an average of just over 3 right turns per minute) do not warrant exclusive right turn lanes on any of the approaches.

With respect to providing a left turn lane on the southbound approach, that is, the north leg of the intersection, it was noted that the developer of Plaza Riedel provided “half-street” improvements (curb, gutter, and sidewalk) along the plaza’s frontages. CivTech estimates the north leg of 10th Avenue to be 36 feet wide west of the Section line within 50 feet of right of way per Yuma County Assessor mapping. To the east of the Section line, the same mapping indicates that there is 33 feet of right of way.

South of Juan Sanchez Boulevard, 10th Avenue has approximately 48 feet of pavement, providing, as noted previously, a northbound left turn lane as well as a paved shoulder on the east side. The west side has been improved with similar half-street improvements as provided on the north leg.

The west side curbs of 10th Avenue align north and south of Juan Sanchez Boulevard. Since a signal is warranted, the north- and southbound approaches should be similar, that is, a new southbound left turn lane should mirror the existing northbound left turn lane. CivTech notes that the extension of the existing edge striping for the northbound

approach is to the east of the existing pavement on the north leg, suggesting that some widening of the pavement of the north leg to the east, perhaps 6 to 8 additional feet is warranted. Although three 12-foot wide lanes can be accommodated on the existing 36 feet of pavement, additional pavement will allow better alignment of the left turn lanes across the intersection, which will improve the sight distances of the drivers of opposing left-turning vehicles and thereby reduce the chances of conflict, improving the overall operation of the intersection.

The storage capacity of the recommended left turn lane is 125 feet, which is more than the minimum required for case 1L per City of Yuma Standard Detail No. 3-352. The capacity was calculated using the methodology of the American Association of State Highway and Transportation Officials, in which the storage length for a turn lane is typically estimated as the length required to hold the average number of arriving vehicles per 1½ signal cycles. Thus, the recommended pavement widening should extend back at least 125 feet from the stop bar with an 80-foot long taper (per the same standard detail) back to the existing edge of pavement.

The future traffic control and lane configuration of the intersection is shown in

Figure 5.**ON-SITE CIRCULATION AND QUEUING ANALYSIS**

CivTech was asked via a comment on the preliminary draft of this study to consider an on-site circulation and queuing analysis for Harvest Prep. In the absence of a full site plan that shows the parking areas, CivTech is left to viewing aerial photographs of the Plaza Reidel, in which the school is located and attempting to determine if there is sufficient area for parents' vehicles to queue when dropping their children off in the morning and picking them up in the afternoon. Before that assessment, the anticipated queue lengths must be calculated.

CivTech has developed a maximum drop-off/pick-up queue storage recommendation rate through observations of queuing characteristics of several schools. Most observations resulted with a maximum queuing length below or near 0.10 vehicle (or 2.5 feet) per student, including the length of the drop-off/pick-up location(s). For recent private school studies, CivTech has recommended providing queue storage of at least 0.10 vehicles per student during the morning drop-off time and 0.15 vehicles (or 3.75 feet) per student during the school release time. Note that on-site circulation does not commonly differ between morning drop-off and afternoon pick-up so 0.15 is generally recommended. It is CivTech's understanding that providing this ratio of on-site queue storage per student is a conservative length sufficient for typical school days.

The results of on-site queuing calculations are provided in Error! Reference source not found. for Harvest Prep. The interim and full enrollments are assumed, reduced by 20% for carpooling and students who walk or ride bicycles. The results summarized in Error! Reference source not found. show that recommended storage lengths for Harvest Prep are 2,025 feet with an interim enrollment of 670 students and 3,000 feet at full enrollment of 1,000 students.

A review of the aerial photography reveals that the Plaza Reidel parking lot is laid out in a somewhat unusual pattern. First of all, the parking field is in the center of the plaza,

LEGEND

| | | | |
|--|--------------------------|--|----------------|
| | Thru or Turning Movement | | Traffic Signal |
| | Two-Way Left Turn-Lane | | Stop Sign |
| | | | Speed Limit |

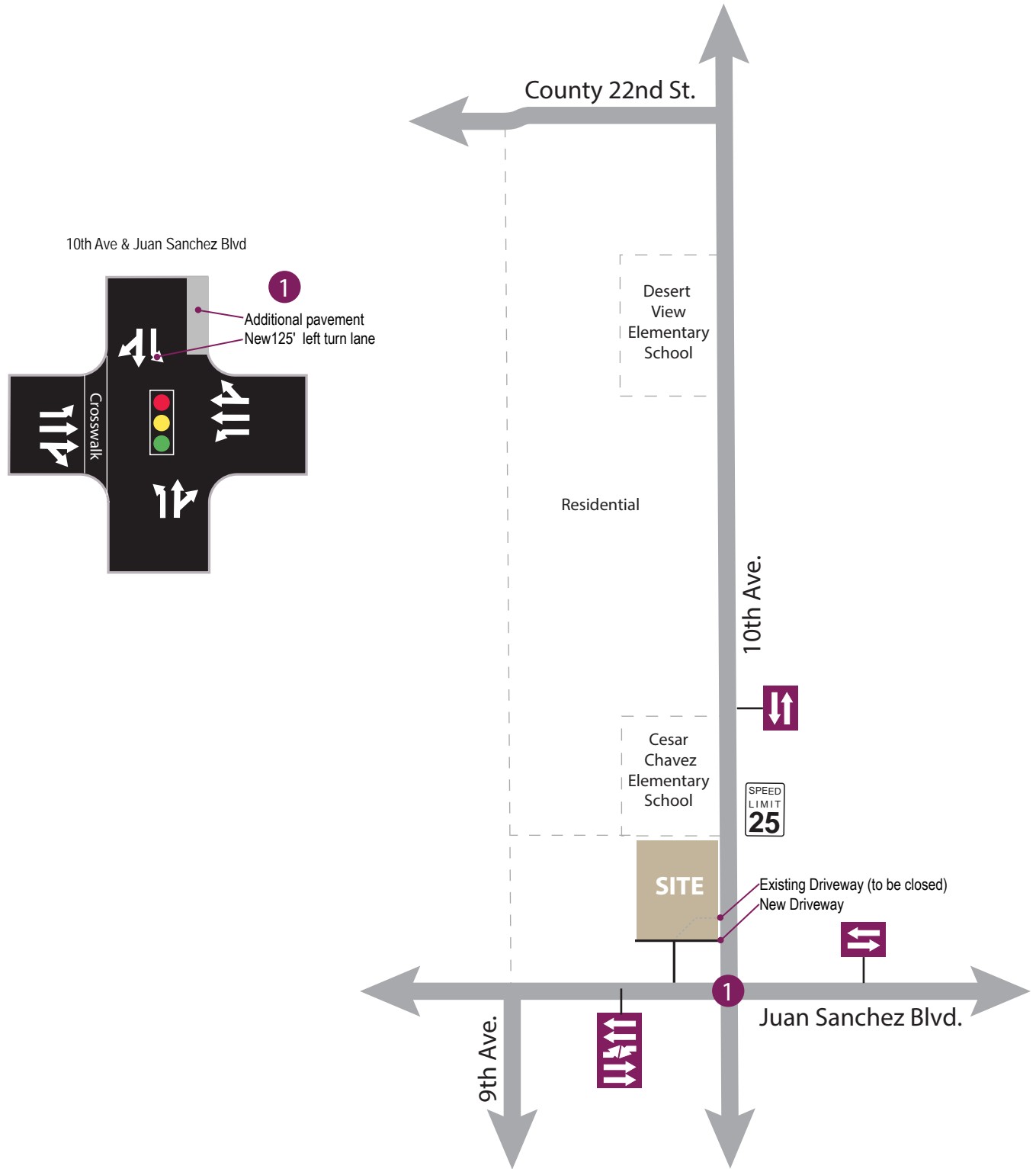


Figure 5: Future Traffic Control and Lane Configuration

Table 7: Estimated Maximum Queue

| Enrollment Condition | Students (after reduction)* | Vehicles / Student Factor | Number of Vehicles | Queue Length |
|-----------------------------|------------------------------------|----------------------------------|---------------------------|---------------------|
| Interim AM Drop-off | 536 | 0.10 | 54 | 1,350 ft. |
| Interim PM Pick-up | 536 | 0.15 | 81 | 2,025 ft. |
| Full AM Drop-off | 800 | 0.10 | 80 | 2,000 ft. |
| Full PM Pick-up | 800 | 0.15 | 120 | 3,000 ft. |

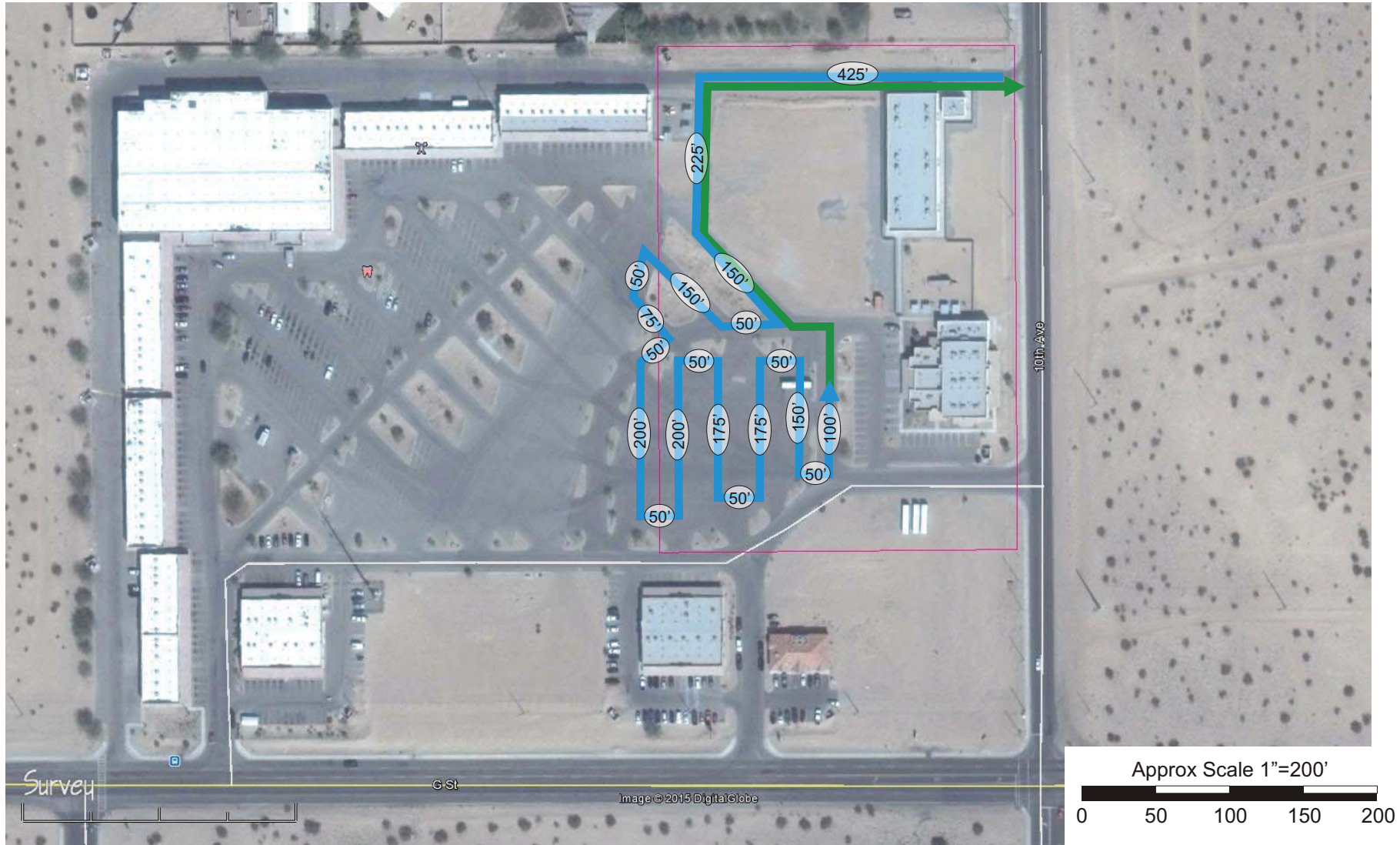
* Number of students enrolled less 20% for carpooling and use of other modes (walking, bicycling).

surrounded by Harvest Prep on the east, other buildings and undeveloped land on the south and then the L-shaped strip plaza on the west and north. The southwest driveway from Juan Sanchez Boulevard splits into three drive aisles: one to the north along the shops on the west side of the plaza, one to the east along the shops on the south side of the plaza, and one to the northeast into the parking field. It is from this northeasterly drive aisle that other parking aisles branch off at right angles. In front of Harvest Prep, there is a drive aisle that begins in a westerly direction and then curves in a 90-degree arc to the south. Previously marked to provide two asphalt basketball courts for Harvest Prep students, the March 2015 photos show evidence of vehicles tracking through it in a radiating pattern from the first driveway on 10th Avenue. The pattern in which the landscaped islands at the end of each parking aisle and along the arc make it difficult to discern a natural circulation pattern of vehicles as they approach the site and queue. Additionally, in the future when more shops and restaurants are built and occupied, there will not be as many empty parking spaces as appear in the aerial photos.

Figure 6 is a conceptual site plan for Harvest Prep. With the unusual parking field, CivTech was still able to show potential queuing of up to 2,425 feet, sufficient to accommodate the current expansion to 670 students and insufficient to accommodate the estimated 3,000 feet that would be required if enrollment were to be increased to 1,000 students. CivTech did not attempt to define where monitors (school staff) might be located to facilitate the flow of traffic. The only criteria CivTech considered were that most of the queuing would be within the property of the school, that paths of entering and exiting vehicles could not cross, and that student drop-off/pick-up would be on the right side of a vehicle. If the school were allowed to queue vehicles around the back of the retail plaza, substantially more queuing could be accommodated; however, that service drive is not on the school's property. CivTech recommends that, in the future, if/when Harvest Prep expands again, the school should be required by the City to provide a circulation plan showing at least 3,000 feet of queuing available before the City approves any plans for the expansion.

SITE DRIVEWAY ACCESS RESTRICTIONS

A comment from the City on the draft of this study raised the issue of the need to restrict movements at the site driveways due to the potential circulation issues of Harvest Prep. The two Plaza Reidel driveways nearest the intersection of 10th Avenue and Juan Sanchez Boulevard are both located approximately 400 feet on-center from the driveway, one on 10th Avenue north of Juan Sanchez Boulevard and the other on Juan Sanchez Boulevard west of 10th Avenue. In many jurisdictions, driveways closer than 660 feet (1/8-



LEGEND

- ▬ Entering
- ▬ Exiting

QUEUING SUMMARY

| | |
|------------------------------|------------|
| Estimated Maximum Queue: | |
| Interim (670 students) | 2,025 feet |
| Ultimate (1,000 students) | 3,000 feet |
| Available Storage (approx.): | 2,425 feet |

Figure 6: Harvest Preparatory Conceptual Circulation Plan



mile) to such an intersection would not be permitted full movements if there were a raised median in the adjacent roadway.

With respect to the driveway on Juan Sanchez Boulevard west of 10th Avenue, this driveway is on the departure side of the intersection; therefore, there would be no queueing with which the driveway could interfere and vice versa. Thus, no restrictions are recommended.

With respect to the first driveway on 10th Avenue north of Juan Sanchez Boulevard, this driveway is on the side of traffic approaching the intersection. A review of the LOS analysis sheets in **Appendix E** reveals that the 95th percentile queue for the southbound movement on 10th Avenue approaching Juan Sanchez Boulevard is expected to be nearly twelve vehicles (300 feet at 25 feet per vehicle) with all-way stop control. With a traffic signal, the 50th percentile queue is less than three vehicles. (HCM 2010 does not calculate a 95th percentile queue for signalized intersections.) Therefore, no movement restrictions at the first Plaza Reidel driveway on 10th Avenue north of Juan Sanchez Boulevard are warranted, either at its current location 400 feet north of Juan Sanchez Boulevard or, if it is eventually relocated, at its future location approximately 300 feet (on-center) north of Juan Sanchez Boulevard. The anticipated queues should not extend so far back that inbound/northbound vehicles turning left into the driveway would be obstructed or that outbound driveway traffic would interfere with the queued vehicles.

ALTERNATIVES MODES

The Safe Routes to School program was a federally-funded program that ended in 2012 that would reimburse entities that implemented programs and strategies that promoted elementary and middle school children to walk and bicycle to school in part by identifying or providing alternative routes and/or making existing routes safer and more convenient. Although the program as it was known has ended, the aims of the original program are still being furthered under the broader funding category of Transportation Alternatives.

This is of note only as a way to introduce the subject of this brief section, which is the availability of facilities that could encourage the use of alternative modes of travel to and from the schools, that is, modes other than motorized vehicles (passenger vehicles and school buses). Two of the obvious facilities that could be provided are sidewalks and bicycle lanes.

A CivTech engineer documented and photographed the area during a field review. The photos and a review of aerial photography reveal there is sidewalk along the west side of 10th Avenue for its entire length up to County 22nd Street; thus, most of the schoolchildren that may walk to school have facilities that separate them from motor vehicles. There are, however, no bicycle lanes on Juan Sanchez Boulevard or 10th Avenue to facilitate the use of bicycles. Nor does it appear, based on improvements already made at the intersection of 10th Avenue and County 22nd Street, that the ultimate cross-section of 10th Avenue will include bicycle lanes. Children bicycling to school will have to learn how to ride safely with traffic if they are to continue to do so.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are documented in this study:

- ◆ The AM and PM peak hour intersection level of service analyses reveal that all study movements currently operate at overall LOS C or better during the peak hours under the existing traffic volumes and traffic controls with the exception of the northbound through/right southbound shared movements, which currently operates at LOS F during the AM peak hour with average control delays of 59.6 and 76.7 seconds, respectively. With simulated winter volumes, that is, with the Juan Sanchez Boulevard through movements recorded in May increased by a seasonal factor of 20%, the results are generally similar, with the corresponding delays increasing to 69.7 and 78.8 seconds. In terms of volume-to-capacity (V/C) ratio, the existing conditions show the southbound approach to be operating during the AM peak hour at just slightly over capacity with a V/C ratio of 1.098.
- ◆ Harvest Prep Academy intends to relocate the first existing driveway north of Juan Sanchez Boulevard to the Plaza Riedel on the west side of 10th Avenue to the south approximately 100 feet. The new location, approximately 300 feet (on center) north of Juan Sanchez Boulevard, exceeds the 150-foot minimum face-of-curb to edge-of-driveway spacing required for the first driveway along a collector roadway per City of Yuma Construction Standard Detail Drawing No. 3-250.
- ◆ The current consolidation and expansion of the Harvest Prep Academy is anticipated to generate an additional 292 trips daily with 98 trips (54 in/44 out) occurring during the AM peak hour, 38 trips (19 in/19 out) occurring during the PM peak hour, and 70 (31 in/39 out) during the school afternoon peak hour (school release time) net of a reduction to account for approximately ten percent of the students walking to school from nearby neighborhoods. At its planned maximum enrollment, Harvest Prep Academy is anticipated to generate an additional 852 trips daily with 284 trips (156 in/128 out) occurring during the AM peak hour, 111 trips (54 in/57 out) occurring during the PM peak hour, and 202 (89 in/113 out) during the school afternoon peak hour (school release time). Thus, with respect to current levels of trips, the total number of trips over current levels could eventually total 1,144 additional trips daily with 382 more (210 in/172 out) occurring during the AM peak hour, 149 more (73 in/76 out) occurring during the PM peak hour, and 272 (120 in/152 out) more during the school afternoon peak hour (school release time).
- ◆ The 2016 opening year level of service reveals that, without and with the proposed and potential school expansion, that the results are similar to the existing condition. With the ultimate expansion of the school, the outbound/southbound 10th Avenue movement approaching Juan Sanchez Boulevard could operate at LOS E during the PM peak hour. The biggest difference in average control delay is expected to occur on the northbound approach, the delay of which is expected to increase from 69.7 seconds as reported earlier to 78.2 sec in 2016 with the increase in the enrollment at Harvest Prep; thereafter, it would increase to 81.2 sec by 2026 if Harvest Prep increases its enrollment further. By 2026 the average control delays without or with the additional trips generated by more Harvest Prep students for both the northbound through/right (79.7 vs. 81.2 sec) and southbound shared (78.8 vs. 81.9 sec)

movements are not very different. Thus, these increases can also be attributed, in part, to the increase in regional traffic volumes on Juan Sanchez Boulevard. The V/C ratio on the southbound approach increases to 1.235 with the additional trips generated by the additional enrollment at Harvest Prep.

- ◆ The 2016 opening year and 2026 horizon year level of service analyses of the intersection of 10th Avenue and Juan Sanchez Boulevard revealed that, without and with the proposed and potential Harvest Prep expansions, a two-phase traffic signal operating with a 90-second cycle with the addition of a new southbound left turn lane would improve the overall operation of the intersection, with all of the movements operating at a good LOS B or better.
- ◆ To summarize the traffic signal needs assessment, the warrant-satisfying criteria have been met or exceeded for the peak hour warrant at the intersection of 10th Avenue and Juan Sanchez Boulevard based on current traffic volumes and numbers of school children crossing here. Since the Gadsden school district has agreed to contribute half of the cost of the signal and Harvest Prep will be required to make a further contribution to the cost of the signal, there is an incentive to install a traffic signal during the current expansion of Harvest Prep rather than wait for some future expansion that may not occur.
- ◆ No exclusive right turn lanes are warranted on any approach to the intersection of 10th Avenue and Juan Sanchez Boulevard. Three of the approaches to the intersection already provide exclusive left turn lanes. If a signal is to be installed, a southbound left turn should be provided.
- ◆ CivTech cites several reasons as justification for the City to require Harvest Prep to contribute up to one-quarter of the cost of the signal. They are detailed in the text.
- ◆ Potential queuing of up to 2,425 feet, sufficient to accommodate the current expansion to 670 students, is available; however, it is insufficient to accommodate the estimated 3,000 feet that would be required if enrollment were to be increased to 1,000 students.
- ◆ Photos from a field review and aerial photography reveal there is sidewalk along the west side of 10th Avenue for its entire length up to County 22nd Street; thus, most of the school children that may walk to school have facilities that separate them from motor vehicles. There are, however, no bicycle lanes on Juan Sanchez Boulevard or 10th Avenue to facilitate the use of bicycles. Nor does it appear, based on improvements already made at the intersection of 10th Avenue and County 22nd Street, that the ultimate cross-section of 10th Avenue will include bicycle lanes. Children bicycling to school will have to learn how to ride safely with traffic if they are to continue to do so.
- ◆ The 95th percentile queue for the southbound movement on 10th Avenue approaching Juan Sanchez Boulevard is expected to be nearly twelve vehicles with all-way stop control. With a traffic signal, which is recommended, the 50th percentile queue is less than three vehicles. Therefore, no movement restrictions at the first Plaza Reidel driveway on 10th Avenue north of Juan Sanchez Boulevard are warranted, either at its current location or, if it is eventually relocated, at its future location approximately 300 feet (on-center) north of Juan Sanchez Boulevard. Nor are restrictions warranted at the first Reidel Plaza driveway on Juan Sanchez Boulevard west of 10th Avenue, primarily because it is a driveway on the departure side of the intersection.

Based on the above conclusions, the following are recommended

- ◆ The north leg of the intersection should be widened to the east in order to provide a new 125-foot long southbound left turn lane approaching the intersection. The new pavement should extend back 125 feet from the stop bar with a minimal 80-foot long taper back to the existing edge of pavement.
- ◆ In the future, if/when Harvest Prep expands again, the school should be required by the City to provide a circulation plan showing at least 3,000 feet of queuing available before the City approves any plans for the expansion.
- ◆ A traffic signal at the intersection of 10th Avenue and Juan Sanchez Boulevard.

CivTech understands that the schedule for implementation of these improvements will be coordinated between the parties funding them, these being the City of San Luis; the developers of the two subdivisions (Comite de Bienestar, the developer of the Beinestar Apartments at 690 North 10th Avenue, and Reidel Construction), each of which have agreed to pay one-fourth of the cost of the signal); and the Harvest Preparatory Academy.

LIST OF REFERENCES

A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials, Washington, D.C., 2011.

Highway Capacity Manual. Transportation Research Board, Washington, D.C., 2010.

Manual on Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

NPTS Urban Travel Patterns Report. December 1999.

Trip Generation Manual, 9th Edition. Institute of Transportation Engineers, Washington, D.C, 2012.

Trip Generation Handbook, 2nd Edition, Institute of Transportation Engineers, Washington, D.C., 2004.

TECHNICAL APPENDIX

| | |
|------------|--------------------------------------|
| APPENDIX A | CITY COMMENTS ON DRAFT STUDY |
| APPENDIX B | PHOTOGRAPHS AND TRAFFIC COUNTS |
| APPENDIX C | EXISTING PEAK HOUR CAPACITY ANALYSIS |
| APPENDIX D | 2016 PEAK HOUR CAPACITY ANALYSIS |
| APPENDIX E | 2026 PEAK HOUR CAPACITY ANALYSIS |

APPENDIX A

CITY COMMENTS ON DRAFT STUDY

From: Eulogio Vera [<mailto:evera@cityofsanluis.org>]
Sent: Wednesday, August 19, 2015 5:41 PM
To: Douglas Nicholls <dnicholls@core-e-g.com>
Cc: Kevin Burge <kburge@core-e-g.com>; Manuel Rojas <MRojas@cityofsanluis.org>
Subject: 10th Avenue and Juan Sanchez Blvd Traffic Study - Comments

Doug-

Below are the comments on the 10th and JS Blvd Traffic Study.

Gadsden School District Schools

Page 2

- Exec. Summary - Gadsden School District has not agreed (or has been approached) to pay a part of this intersection improvements. Talking to the City Attorney, it would be very difficult to get any funding from the school if they are not willing to participate. Though, per existing development agreements, each of the two developers who built the subdivisions to the north along 10th Avenue agreed to pay a quarter of the cost for the signal.

Page 5

- Speed limit on Juan Sanchez west of 10th Avenue is posted 35 MPH.

Page 8

- First paragraph - Intersection is already an AWSC intersection.

Page 9

Information on this page is mainly what I wanted to discuss with you.

- Would the overall traffic study benefit from reviewing onsite traffic circulation and queuing? Existing driveway location (and possible new location noted in report) on 10th off the shopping center could be critical to the intersection. Would they have to be right only (including ones of JSB)?

Page 21

- Harvest Prep, Bienestar, and Reidel Construction would be the only private contributors to the cost of the signal. Gadsden Elementary School will probably not want to contribute.

Please review and let me know if you have any questions. Also, could you provide a time frame as to when you anticipate finalizing it.

Thanks
Eulogio

APPENDIX B

PHOTOGRAPHS AND TRAFFIC COUNTS



1. Looking East at utility line crossing



2. Looking north on NWC



3. NEC looking north



4. NEC looking NW at power lines



5. NEC looking south



6. NEC looking west 2



7. NEC looking west



8. NEC no curb or ramps



9. NEC signs



10. North leg by school



11. NWC 1



12. NWC looking east



13. NWC Looking north



14. NWC looking NW



15. NWC looking west



16. NWC Ped Crossing



17. NWC Ped Ramp



18. NWC Ped ramps and crosswalk



19. NWC Power Drop



20. NWC Ramp



21. NWC Stop oversized



22. NWC Utility boxes



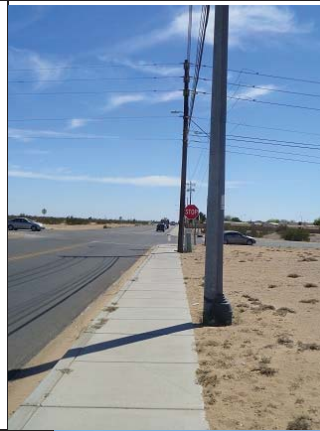
23. SEC ADOT Pull Box



24. SWC looking west



25. SEC regulation size stop sign



26. Southbound approach utility poles



27. SWC ADOT Pull box



28. SWC looking east 2



29. SWC looking east



30. SWC Ped Ramp



31. SWC Signs, ADOT pullbox, looking NE



32. SWC Utilities



33. West leg School crossing sign

Juan Sanchez Boulevard and 10th Avenue

5/11/2015

| Street Name | PED | 10TH AVENUE - From North | | | | | PED | JUAN SANCHEZ BOULEVARD - From East | | | | | PED | 10TH AVENUE - From South | | | | | PED | JUAN SANCHEZ BOULEVARD - From West | | | | | Grand Total |
|------------------|-----------|--------------------------|------------|------------|------------|----------|------------|------------------------------------|------------|-------------|----------|------------|------------|--------------------------|------------|----------|-----------|------------|------------|------------------------------------|-------------|------|------|-------|-------------|
| | | West | Right | Thru | Left | Total | | North | Right | Thru | Left | Total | | East | Right | Thru | Left | Total | | South | Right | Thru | Left | Total | |
| 6:30 | 0 | 12 | 7 | 15 | 34 | 0 | 9 | 27 | 6 | 42 | 0 | 33 | 5 | 3 | 41 | 0 | 0 | 60 | 7 | 67 | 184 | | | | |
| 6:45 | 10 | 25 | 10 | 11 | 46 | 0 | 15 | 38 | 9 | 62 | 0 | 21 | 28 | 6 | 55 | 0 | 3 | 55 | 24 | 82 | 245 | | | | |
| 7:00 | 10 | 28 | 35 | 25 | 88 | 0 | 21 | 40 | 15 | 76 | 0 | 23 | 59 | 18 | 100 | 0 | 3 | 50 | 45 | 98 | 362 | | | | |
| 7:15 | 1 | 28 | 45 | 28 | 101 | 0 | 15 | 35 | 10 | 60 | 0 | 30 | 57 | 19 | 106 | 0 | 7 | 76 | 43 | 126 | 393 | | | | |
| 7:30 | 0 | 22 | 53 | 28 | 103 | 0 | 11 | 30 | 17 | 58 | 0 | 52 | 61 | 7 | 120 | 0 | 5 | 78 | 45 | 128 | 409 | | | | |
| 7:45 | 9 | 32 | 30 | 27 | 89 | 0 | 24 | 35 | 14 | 73 | 0 | 28 | 32 | 9 | 69 | 0 | 2 | 54 | 18 | 74 | 305 | | | | |
| 8:00 | 1 | 19 | 23 | 24 | 66 | 0 | 22 | 29 | 7 | 58 | 0 | 16 | 17 | 5 | 38 | 0 | 3 | 48 | 20 | 71 | 233 | | | | |
| 8:15 | 0 | 19 | 6 | 16 | 41 | 0 | 5 | 29 | 3 | 37 | 0 | 26 | 9 | 3 | 38 | 0 | 4 | 54 | 8 | 66 | 182 | | | | |
| 7-9 Total | 31 | 185 | 209 | 174 | 568 | 0 | 122 | 263 | 81 | 466 | 0 | 229 | 268 | 70 | 567 | 0 | 27 | 475 | 210 | 712 | 2313 | | | | |
| 2:30 | 5 | 41 | 34 | 8 | 83 | 0 | 15 | 55 | 30 | 100 | 0 | 18 | 32 | 4 | 54 | 0 | 6 | 38 | 30 | 74 | 311 | | | | |
| 2:45 | 0 | 50 | 26 | 21 | 97 | 0 | 17 | 72 | 23 | 112 | 0 | 25 | 16 | 6 | 47 | 0 | 8 | 53 | 30 | 91 | 347 | | | | |
| 3:00 | 1 | 29 | 13 | 14 | 56 | 0 | 19 | 62 | 30 | 111 | 0 | 18 | 16 | 13 | 47 | 0 | 4 | 37 | 25 | 66 | 280 | | | | |
| 3:15 | 0 | 21 | 26 | 17 | 64 | 0 | 15 | 72 | 27 | 114 | 0 | 18 | 13 | 6 | 37 | 0 | 5 | 60 | 22 | 87 | 302 | | | | |
| 3:30 | 6 | 24 | 18 | 21 | 63 | 0 | 16 | 66 | 30 | 112 | 0 | 14 | 12 | 7 | 33 | 0 | 7 | 53 | 16 | 76 | 284 | | | | |
| 3:45 | 0 | 26 | 15 | 17 | 58 | 0 | 22 | 86 | 33 | 141 | 0 | 18 | 17 | 7 | 42 | 0 | 9 | 61 | 30 | 100 | 341 | | | | |
| 4:00 | 0 | 26 | 18 | 13 | 57 | 0 | 14 | 83 | 42 | 139 | 0 | 22 | 15 | 4 | 41 | 0 | 1 | 52 | 24 | 77 | 314 | | | | |
| 4:15 | 0 | 19 | 15 | 10 | 44 | 0 | 30 | 115 | 47 | 192 | 0 | 22 | 11 | 4 | 37 | 0 | 5 | 49 | 30 | 84 | 357 | | | | |
| 4-6 Total | 12 | 236 | 165 | 121 | 522 | 0 | 148 | 611 | 262 | 1021 | 0 | 155 | 132 | 51 | 338 | 0 | 45 | 403 | 207 | 655 | 2536 | | | | |

Courtesy of Core Engineering Group, PLLC

APPENDIX C

EXISTING PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.991 | | 0.950 | | 0.942 | | 0.961 | | 0.986 | | 0.986 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3507 | 0 | 1770 | 3362 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3507 | 0 | 1770 | 3362 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.986 | | 0.972 | | 0.913 | | 0.942 | | 0.986 | | 0.986 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3490 | 0 | 1770 | 3440 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3490 | 0 | 1770 | 3440 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 43 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 151 | 258 | 17 | 0 | 56 | 140 | 71 | 0 | 53 | 209 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 164 | 280 | 18 | 0 | 61 | 152 | 77 | 0 | 58 | 227 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 19.5 | 16.6 | 53.5 |
| HCM LOS | C | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 28% |
| Vol Thru, % | 0% | 61% | 0% | 100% | 83% | 0% | 100% | 40% | 43% |
| Vol Right, % | 0% | 39% | 0% | 0% | 17% | 0% | 0% | 60% | 29% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 342 | 151 | 172 | 103 | 56 | 93 | 118 | 381 |
| LT Vol | 0 | 209 | 0 | 172 | 86 | 0 | 93 | 47 | 163 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 110 |
| RT Vol | 53 | 0 | 151 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 372 | 164 | 187 | 112 | 61 | 101 | 128 | 414 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.156 | 0.93 | 0.45 | 0.486 | 0.288 | 0.176 | 0.28 | 0.338 | 1 |
| Departure Headway (Hd) | 9.773 | 9.005 | 9.862 | 9.364 | 9.249 | 10.433 | 9.935 | 9.514 | 9.307 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 368 | 401 | 364 | 383 | 387 | 343 | 361 | 377 | 393 |
| Service Time | 7.524 | 6.756 | 7.644 | 7.145 | 7.03 | 8.222 | 7.724 | 7.303 | 7.007 |
| HCM Lane V/C Ratio | 0.158 | 0.928 | 0.451 | 0.488 | 0.289 | 0.178 | 0.28 | 0.34 | 1.053 |
| HCM Control Delay | 14.3 | 59.6 | 20.5 | 20.8 | 15.8 | 15.5 | 16.6 | 17.1 | 76.7 |
| HCM Lane LOS | B | F | C | C | C | C | C | C | F |
| HCM 95th-tile Q | 0.5 | 10.2 | 2.3 | 2.6 | 1.2 | 0.6 | 1.1 | 1.5 | 12 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 16.6 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 100 | 215 | 22 | 0 | 152 | 350 | 82 | 0 | 22 | 55 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 109 | 234 | 24 | 0 | 165 | 380 | 89 | 0 | 24 | 60 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 14.4 | 16.8 | 14.8 |
| HCM LOS | B | C | B |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 27% |
| Vol Thru, % | 0% | 42% | 0% | 100% | 77% | 0% | 100% | 59% | 30% |
| Vol Right, % | 0% | 58% | 0% | 0% | 23% | 0% | 0% | 41% | 43% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 131 | 100 | 143 | 94 | 152 | 233 | 199 | 222 |
| LT Vol | 0 | 55 | 0 | 143 | 72 | 0 | 233 | 117 | 66 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 95 |
| RT Vol | 22 | 0 | 100 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 142 | 109 | 156 | 102 | 165 | 254 | 216 | 241 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.062 | 0.329 | 0.26 | 0.351 | 0.224 | 0.37 | 0.532 | 0.435 | 0.547 |
| Departure Headway (Hd) | 9.338 | 8.313 | 8.623 | 8.107 | 7.937 | 8.068 | 7.554 | 7.257 | 8.168 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 386 | 430 | 415 | 441 | 450 | 444 | 474 | 495 | 439 |
| Service Time | 7.038 | 6.112 | 6.414 | 5.897 | 5.728 | 5.849 | 5.335 | 5.037 | 5.958 |
| HCM Lane V/C Ratio | 0.062 | 0.33 | 0.263 | 0.354 | 0.227 | 0.372 | 0.536 | 0.436 | 0.549 |
| HCM Control Delay | 12.7 | 15.2 | 14.4 | 15.3 | 13 | 15.6 | 18.7 | 15.6 | 20.5 |
| HCM Lane LOS | B | C | B | C | B | C | C | C | C |
| HCM 95th-tile Q | 0.2 | 1.4 | 1 | 1.6 | 0.8 | 1.7 | 3.1 | 2.2 | 3.2 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 163 | 110 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 177 | 120 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 76.7 | | |
| HCM LOS | | F | | |
| Lane | | | | |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 66 | 95 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 72 | 103 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 20.5 | | |
| HCM LOS | | C | | |
| Lane | | | | |

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.992 | | 0.956 | | 0.942 | | 0.961 | | | | | |
| Flt Protected | 0.950 | | 0.950 | | 0.950 | | | | | | 0.986 | |
| Satd. Flow (prot) | 1770 | 3511 | 0 | 1770 | 3383 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Flt Permitted | 0.950 | | 0.950 | | 0.950 | | | | | | 0.986 | |
| Satd. Flow (perm) | 1770 | 3511 | 0 | 1770 | 3383 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | | 25 | | 25 | | 25 | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.988 | | 0.976 | | 0.913 | | 0.942 | | | | | |
| Flt Protected | 0.950 | | 0.950 | | 0.950 | | | | | | 0.986 | |
| Satd. Flow (prot) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Flt Permitted | 0.950 | | 0.950 | | 0.950 | | | | | | 0.986 | |
| Satd. Flow (perm) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 45.5 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 151 | 310 | 17 | 0 | 56 | 168 | 71 | 0 | 53 | 209 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 164 | 337 | 18 | 0 | 61 | 183 | 77 | 0 | 58 | 227 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|----|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 22.2 | 18 | 62.3 |
| HCM LOS | C | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|-------|--------|-------|-------|--------|--------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 28% |
| Vol Thru, % | 0% | 61% | 0% | 100% | 86% | 0% | 100% | 44% | 43% |
| Vol Right, % | 0% | 39% | 0% | 0% | 14% | 0% | 0% | 56% | 29% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 342 | 151 | 207 | 120 | 56 | 112 | 127 | 381 |
| LT Vol | 0 | 209 | 0 | 207 | 103 | 0 | 112 | 56 | 163 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 110 |
| RT Vol | 53 | 0 | 151 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 372 | 164 | 225 | 131 | 61 | 122 | 138 | 414 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.162 | 0.969 | 0.46 | 0.599 | 0.345 | 0.181 | 0.346 | 0.377 | 1 |
| Departure Headway (Hd) | 10.151 | 9.384 | 10.099 | 9.601 | 9.502 | 10.732 | 10.234 | 9.844 | 9.765 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 354 | 387 | 356 | 375 | 378 | 334 | 351 | 364 | 377 |
| Service Time | 7.898 | 7.131 | 7.874 | 7.376 | 7.277 | 8.515 | 8.017 | 7.627 | 7.465 |
| HCM Lane V/C Ratio | 0.164 | 0.961 | 0.461 | 0.6 | 0.347 | 0.183 | 0.348 | 0.379 | 1.098 |
| HCM Control Delay | 14.9 | 69.7 | 21.3 | 25.8 | 17.2 | 15.9 | 18.4 | 18.5 | 78.8 |
| HCM Lane LOS | B | F | C | D | C | C | C | C | F |
| HCM 95th-tile Q | 0.6 | 11.1 | 2.3 | 3.7 | 1.5 | 0.7 | 1.5 | 1.7 | 11.8 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 19.4 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 100 | 258 | 22 | 0 | 152 | 420 | 82 | 0 | 22 | 55 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 109 | 280 | 24 | 0 | 165 | 457 | 89 | 0 | 24 | 60 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|----|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 16.2 | 20.8 | 16 |
| HCM LOS | C | C | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 27% |
| Vol Thru, % | 0% | 42% | 0% | 100% | 80% | 0% | 100% | 63% | 30% |
| Vol Right, % | 0% | 58% | 0% | 0% | 20% | 0% | 0% | 37% | 43% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 131 | 100 | 172 | 108 | 152 | 280 | 222 | 222 |
| LT Vol | 0 | 55 | 0 | 172 | 86 | 0 | 280 | 140 | 66 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 95 |
| RT Vol | 22 | 0 | 100 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 142 | 109 | 187 | 117 | 165 | 304 | 241 | 241 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.065 | 0.353 | 0.273 | 0.443 | 0.273 | 0.387 | 0.669 | 0.513 | 0.585 |
| Departure Headway (Hd) | 9.855 | 8.925 | 9.042 | 8.525 | 8.377 | 8.43 | 7.914 | 7.648 | 8.727 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 363 | 403 | 398 | 423 | 428 | 428 | 457 | 473 | 413 |
| Service Time | 7.614 | 6.683 | 6.791 | 6.273 | 6.126 | 6.173 | 5.657 | 5.39 | 6.477 |
| HCM Lane V/C Ratio | 0.066 | 0.352 | 0.274 | 0.442 | 0.273 | 0.386 | 0.665 | 0.51 | 0.584 |
| HCM Control Delay | 13.3 | 16.5 | 15.2 | 17.9 | 14.3 | 16.4 | 25.3 | 18.2 | 23.1 |
| HCM Lane LOS | B | C | C | C | B | C | D | C | C |
| HCM 95th-tile Q | 0.2 | 1.6 | 1.1 | 2.2 | 1.1 | 1.8 | 4.8 | 2.9 | 3.6 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 163 | 110 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 177 | 120 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 78.8 | | |
| HCM LOS | | F | | |
| Lane | | | | |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 66 | 95 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 72 | 103 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 23.1 | | |
| HCM LOS | | C | | |
| Lane | | | | |

APPENDIX D

2016 TOTAL PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.993 | | 0.956 | | 0.942 | | 0.961 | | 0.986 | | 0.986 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3514 | 0 | 1770 | 3383 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3514 | 0 | 1770 | 3383 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.988 | | 0.976 | | 0.913 | | 0.942 | | 0.986 | | 0.986 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 45.9 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 151 | 316 | 17 | 0 | 56 | 171 | 71 | 0 | 53 | 209 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 164 | 343 | 18 | 0 | 61 | 186 | 77 | 0 | 58 | 227 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 22.7 | 18.1 | 63.3 |
| HCM LOS | C | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|-------|--------|-------|-------|--------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 28% |
| Vol Thru, % | 0% | 61% | 0% | 100% | 86% | 0% | 100% | 45% | 43% |
| Vol Right, % | 0% | 39% | 0% | 0% | 14% | 0% | 0% | 55% | 29% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 342 | 151 | 211 | 122 | 56 | 114 | 128 | 381 |
| LT Vol | 0 | 209 | 0 | 211 | 105 | 0 | 114 | 57 | 163 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 110 |
| RT Vol | 53 | 0 | 151 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 372 | 164 | 229 | 133 | 61 | 124 | 139 | 414 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.163 | 0.973 | 0.462 | 0.612 | 0.352 | 0.182 | 0.353 | 0.382 | 1 |
| Departure Headway (Hd) | 10.194 | 9.427 | 10.125 | 9.627 | 9.53 | 10.768 | 10.27 | 9.883 | 9.819 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 353 | 387 | 356 | 376 | 376 | 333 | 349 | 363 | 373 |
| Service Time | 7.942 | 7.175 | 7.9 | 7.402 | 7.305 | 8.549 | 8.051 | 7.664 | 7.519 |
| HCM Lane V/C Ratio | 0.164 | 0.961 | 0.461 | 0.609 | 0.354 | 0.183 | 0.355 | 0.383 | 1.11 |
| HCM Control Delay | 14.9 | 70.8 | 21.4 | 26.6 | 17.4 | 15.9 | 18.6 | 18.7 | 79 |
| HCM Lane LOS | B | F | C | D | C | C | C | C | F |
| HCM 95th-tile Q | 0.6 | 11.2 | 2.3 | 3.9 | 1.6 | 0.7 | 1.6 | 1.7 | 11.7 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 19.8 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 100 | 263 | 22 | 0 | 152 | 428 | 82 | 0 | 22 | 55 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 109 | 286 | 24 | 0 | 165 | 465 | 89 | 0 | 24 | 60 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 16.4 | 21.4 | 16.1 |
| HCM LOS | C | C | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 27% |
| Vol Thru, % | 0% | 42% | 0% | 100% | 80% | 0% | 100% | 64% | 30% |
| Vol Right, % | 0% | 58% | 0% | 0% | 20% | 0% | 0% | 36% | 43% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 131 | 100 | 175 | 110 | 152 | 285 | 225 | 222 |
| LT Vol | 0 | 55 | 0 | 175 | 88 | 0 | 285 | 143 | 66 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 95 |
| RT Vol | 22 | 0 | 100 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 142 | 109 | 191 | 119 | 165 | 310 | 244 | 241 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.066 | 0.355 | 0.274 | 0.453 | 0.279 | 0.388 | 0.685 | 0.521 | 0.589 |
| Departure Headway (Hd) | 9.917 | 8.986 | 9.08 | 8.563 | 8.417 | 8.463 | 7.947 | 7.684 | 8.782 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 361 | 400 | 396 | 421 | 427 | 426 | 456 | 469 | 410 |
| Service Time | 7.676 | 6.744 | 6.831 | 6.313 | 6.167 | 6.208 | 5.692 | 5.428 | 6.533 |
| HCM Lane V/C Ratio | 0.066 | 0.355 | 0.275 | 0.454 | 0.279 | 0.387 | 0.68 | 0.52 | 0.588 |
| HCM Control Delay | 13.4 | 16.6 | 15.2 | 18.3 | 14.4 | 16.5 | 26.3 | 18.5 | 23.4 |
| HCM Lane LOS | B | C | C | C | B | C | D | C | C |
| HCM 95th-tile Q | 0.2 | 1.6 | 1.1 | 2.3 | 1.1 | 1.8 | 5.1 | 3 | 3.7 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|---------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 163 | 110 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 177 | 120 |
| Number of Lanes | 0 | 0 | 1 | 0 |

| Approach | SB |
|----------------------------|----|
| Opposing Approach | NB |
| Opposing Lanes | 2 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 3 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 79 |
| HCM LOS | F |

Lane

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|---------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 66 | 95 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 72 | 103 |
| Number of Lanes | 0 | 0 | 1 | 0 |

| Approach | SB |
|----------------------------|------|
| Opposing Approach | NB |
| Opposing Lanes | 2 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 3 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 23.4 |
| HCM LOS | C |

Lane

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.993 | | 0.956 | | 0.944 | | 0.956 | | 0.987 | | 0.987 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3514 | 0 | 1770 | 3383 | 0 | 1770 | 1758 | 0 | 0 | 1758 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3514 | 0 | 1770 | 3383 | 0 | 1770 | 1758 | 0 | 0 | 1758 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | 0% | | 0% | | 0% | | 0% | | 0% | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.988 | | 0.976 | | 0.919 | | 0.938 | | 0.988 | | 0.988 | |
| Fit Protected | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (prot) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1712 | 0 | 0 | 1726 | 0 |
| Fit Permitted | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 |
| Satd. Flow (perm) | 1770 | 3497 | 0 | 1770 | 3454 | 0 | 1770 | 1712 | 0 | 0 | 1726 | 0 |
| Link Speed (mph) | 45 | | 45 | | 25 | | 25 | | 25 | | 25 | |
| Link Distance (ft) | 500 | | 200 | | 500 | | 500 | | 500 | | 500 | |
| Travel Time (s) | 7.6 | | 3.0 | | 13.6 | | 13.6 | | 13.6 | | 13.6 | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 48.8 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 183 | 316 | 17 | 0 | 56 | 171 | 71 | 0 | 53 | 225 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 199 | 343 | 18 | 0 | 61 | 186 | 77 | 0 | 58 | 245 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 24.4 | 18.6 | 70.1 |
| HCM LOS | C | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|-------|--------|-------|-------|--------|--------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 26% |
| Vol Thru, % | 0% | 63% | 0% | 100% | 86% | 0% | 100% | 45% | 42% |
| Vol Right, % | 0% | 37% | 0% | 0% | 14% | 0% | 0% | 55% | 32% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 358 | 183 | 211 | 122 | 56 | 114 | 128 | 420 |
| LT Vol | 0 | 225 | 0 | 211 | 105 | 0 | 114 | 57 | 176 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 136 |
| RT Vol | 53 | 0 | 183 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 389 | 199 | 229 | 133 | 61 | 124 | 139 | 457 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.165 | 1 | 0.566 | 0.62 | 0.356 | 0.186 | 0.361 | 0.39 | 1 |
| Departure Headway (Hd) | 10.306 | 9.551 | 10.244 | 9.745 | 9.648 | 10.985 | 10.487 | 10.1 | 9.764 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 347 | 377 | 352 | 371 | 374 | 327 | 343 | 356 | 370 |
| Service Time | 8.098 | 7.343 | 7.988 | 7.49 | 7.393 | 8.74 | 8.242 | 7.855 | 7.559 |
| HCM Lane V/C Ratio | 0.167 | 1.032 | 0.565 | 0.617 | 0.356 | 0.187 | 0.362 | 0.39 | 1.235 |
| HCM Control Delay | 15.1 | 78.2 | 25.6 | 27.2 | 17.7 | 16.2 | 19.1 | 19.2 | 79.2 |
| HCM Lane LOS | C | F | D | D | C | C | C | C | F |
| HCM 95th-tile Q | 0.6 | 11.8 | 3.3 | 4 | 1.6 | 0.7 | 1.6 | 1.8 | 11.7 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 22.8 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 119 | 263 | 22 | 0 | 152 | 428 | 82 | 0 | 22 | 64 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 129 | 286 | 24 | 0 | 165 | 465 | 89 | 0 | 24 | 70 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|----|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 17.7 | 24 | 17.9 |
| HCM LOS | C | C | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 24% |
| Vol Thru, % | 0% | 46% | 0% | 100% | 80% | 0% | 100% | 64% | 30% |
| Vol Right, % | 0% | 54% | 0% | 0% | 20% | 0% | 0% | 36% | 46% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 140 | 119 | 175 | 110 | 152 | 285 | 225 | 257 |
| LT Vol | 0 | 64 | 0 | 175 | 88 | 0 | 285 | 143 | 78 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 118 |
| RT Vol | 22 | 0 | 119 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 152 | 129 | 191 | 119 | 165 | 310 | 244 | 279 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.069 | 0.4 | 0.341 | 0.475 | 0.292 | 0.409 | 0.722 | 0.551 | 0.701 |
| Departure Headway (Hd) | 10.367 | 9.458 | 9.497 | 8.977 | 8.831 | 8.903 | 8.384 | 8.119 | 9.037 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 345 | 380 | 378 | 400 | 406 | 405 | 431 | 444 | 399 |
| Service Time | 8.147 | 7.238 | 7.269 | 6.748 | 6.601 | 6.666 | 6.147 | 5.882 | 6.809 |
| HCM Lane V/C Ratio | 0.07 | 0.4 | 0.341 | 0.477 | 0.293 | 0.407 | 0.719 | 0.55 | 0.699 |
| HCM Control Delay | 13.9 | 18.5 | 17.1 | 19.7 | 15.2 | 17.7 | 30.2 | 20.5 | 30.6 |
| HCM Lane LOS | B | C | C | C | C | C | D | C | D |
| HCM 95th-tile Q | 0.2 | 1.9 | 1.5 | 2.5 | 1.2 | 1.9 | 5.6 | 3.3 | 5.2 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|---------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 176 | 136 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 191 | 148 |
| Number of Lanes | 0 | 0 | 1 | 0 |

| Approach | SB |
|----------------------------|------|
| Opposing Approach | NB |
| Opposing Lanes | 2 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 3 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 79.2 |
| HCM LOS | F |

Lane

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|---------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 78 | 118 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 85 | 128 |
| Number of Lanes | 0 | 0 | 1 | 0 |

| Approach | SB |
|----------------------------|------|
| Opposing Approach | NB |
| Opposing Lanes | 2 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 3 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 30.6 |
| HCM LOS | D |

Lane

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 151 | 316 | 17 | 56 | 171 | 71 | 53 | 209 | 133 | 108 | 163 | 110 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.97 | 0.98 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 164 | 343 | 18 | 61 | 186 | 77 | 58 | 227 | 145 | 117 | 177 | 120 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 508 | 1192 | 62 | 457 | 862 | 344 | 540 | 475 | 304 | 481 | 463 | 314 |
| Arrive On Green | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1112 | 3416 | 179 | 1001 | 2472 | 987 | 1070 | 1057 | 675 | 1000 | 1030 | 698 |
| Grp Volume(v), veh/h | 164 | 177 | 184 | 61 | 131 | 132 | 58 | 0 | 372 | 117 | 0 | 297 |
| Grp Sat Flow(s),veh/h/ln | 1112 | 1770 | 1825 | 1001 | 1770 | 1689 | 1070 | 0 | 1733 | 1000 | 0 | 1728 |
| Q Serve(g_s), s | 4.8 | 2.9 | 2.9 | 1.9 | 2.1 | 2.2 | 1.5 | 0.0 | 6.0 | 3.7 | 0.0 | 4.5 |
| Cycle Q Clear(g_c), s | 7.0 | 2.9 | 2.9 | 4.8 | 2.1 | 2.2 | 6.0 | 0.0 | 6.0 | 9.7 | 0.0 | 4.5 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.58 | 1.00 | | 0.39 | 1.00 | | 0.40 |
| Lane Grp Cap(c), veh/h | 508 | 617 | 637 | 457 | 617 | 589 | 540 | 0 | 779 | 481 | 0 | 777 |
| V/C Ratio(X) | 0.32 | 0.29 | 0.29 | 0.13 | 0.21 | 0.22 | 0.11 | 0.00 | 0.48 | 0.24 | 0.00 | 0.38 |
| Avail Cap(c_a), veh/h | 1185 | 1694 | 1747 | 1066 | 1694 | 1617 | 1245 | 0 | 1921 | 1140 | 0 | 1916 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.6 | 9.3 | 9.4 | 11.1 | 9.1 | 9.1 | 9.3 | 0.0 | 7.7 | 11.0 | 0.0 | 7.3 |
| Incr Delay (d2), s/veh | 0.4 | 0.3 | 0.2 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.5 | 0.3 | 0.0 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 1.4 | 1.5 | 0.5 | 1.0 | 1.1 | 0.4 | 0.0 | 2.9 | 1.0 | 0.0 | 2.2 |
| LnGrp Delay(d),s/veh | 12.0 | 9.6 | 9.6 | 11.2 | 9.3 | 9.3 | 9.4 | 0.0 | 8.1 | 11.3 | 0.0 | 7.6 |
| LnGrp LOS | B | A | A | B | A | A | A | | A | B | | A |
| Approach Vol, veh/h | 525 | | | 324 | | | | 430 | | | 414 | |
| Approach Delay, s/veh | 10.3 | | | 9.6 | | | | 8.3 | | | 8.6 | |
| Approach LOS | B | | | A | | | | A | | | A | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 21.8 | | 17.8 | | 21.8 | | 17.8 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 44.0 | | 38.0 | | 44.0 | | 38.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 8.0 | | 9.0 | | 11.7 | | 6.8 | | | | | |
| Green Ext Time (p_c), s | 6.3 | | 4.6 | | 6.2 | | 4.6 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 9.3 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 100 | 263 | 22 | 152 | 428 | 82 | 22 | 55 | 76 | 61 | 66 | 95 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 0.99 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 109 | 286 | 24 | 165 | 465 | 89 | 24 | 60 | 83 | 66 | 72 | 103 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 545 | 1573 | 131 | 673 | 1413 | 269 | 452 | 194 | 269 | 479 | 190 | 272 |
| Arrive On Green | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Sat Flow, veh/h | 851 | 3304 | 275 | 1057 | 2968 | 565 | 1194 | 703 | 973 | 1229 | 689 | 985 |
| Grp Volume(v), veh/h | 109 | 152 | 158 | 165 | 276 | 278 | 24 | 0 | 143 | 66 | 0 | 175 |
| Grp Sat Flow(s),veh/h/ln | 851 | 1770 | 1810 | 1057 | 1770 | 1763 | 1194 | 0 | 1676 | 1229 | 0 | 1674 |
| Q Serve(g_s), s | 3.0 | 1.6 | 1.6 | 3.4 | 3.1 | 3.2 | 0.5 | 0.0 | 2.2 | 1.5 | 0.0 | 2.7 |
| Cycle Q Clear(g_c), s | 6.1 | 1.6 | 1.6 | 5.0 | 3.1 | 3.2 | 3.3 | 0.0 | 2.2 | 3.6 | 0.0 | 2.7 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.32 | 1.00 | | 0.58 | 1.00 | | 0.59 |
| Lane Grp Cap(c), veh/h | 545 | 842 | 862 | 673 | 842 | 839 | 452 | 0 | 463 | 479 | 0 | 462 |
| V/C Ratio(X) | 0.20 | 0.18 | 0.18 | 0.25 | 0.33 | 0.33 | 0.05 | 0.00 | 0.31 | 0.14 | 0.00 | 0.38 |
| Avail Cap(c_a), veh/h | 1457 | 2740 | 2803 | 1807 | 2740 | 2730 | 1306 | 0 | 1661 | 1358 | 0 | 1659 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 7.2 | 4.8 | 4.9 | 6.3 | 5.3 | 5.3 | 10.8 | 0.0 | 9.2 | 10.7 | 0.0 | 9.4 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.4 | 0.1 | 0.0 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.8 | 0.8 | 1.0 | 1.5 | 1.5 | 0.2 | 0.0 | 1.0 | 0.5 | 0.0 | 1.3 |
| LnGrp Delay(d),s/veh | 7.3 | 5.0 | 5.0 | 6.5 | 5.5 | 5.5 | 10.8 | 0.0 | 9.6 | 10.8 | 0.0 | 10.0 |
| LnGrp LOS | A | A | A | A | A | A | B | | A | B | | A |
| Approach Vol, veh/h | 419 | | | 719 | | | | 167 | | | 241 | |
| Approach Delay, s/veh | 5.6 | | | 5.7 | | | | 9.8 | | | 10.2 | |
| Approach LOS | A | | | A | | | | A | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 12.9 | | 19.4 | | 12.9 | | 19.4 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 32.0 | | 50.0 | | 32.0 | | 50.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 5.3 | | 8.1 | | 5.6 | | 7.0 | | | | | |
| Green Ext Time (p_c), s | 2.5 | | 7.2 | | 2.5 | | 7.2 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 6.8 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 48 | 42 | 48 | 42 |
| Maximum Split (%) | 53.3% | 46.7% | 53.3% | 46.7% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 48 | 0 | 48 |
| End Time (s) | 48 | 0 | 48 | 0 |
| Yield/Force Off (s) | 44 | 86 | 44 | 86 |
| Yield/Force Off 170(s) | 44 | 75 | 44 | 75 |
| Local Start Time (s) | 0 | 48 | 0 | 48 |
| Local Yield (s) | 44 | 86 | 44 | 86 |
| Local Yield 170(s) | 44 | 75 | 44 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| 2 | 4 |
| 48 s | 42 s |
| 6 | 8 |
| 48 s | 42 s |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 36 | 54 | 36 | 54 |
| Maximum Split (%) | 40.0% | 60.0% | 40.0% | 60.0% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 36 | 0 | 36 |
| End Time (s) | 36 | 0 | 36 | 0 |
| Yield/Force Off (s) | 32 | 86 | 32 | 86 |
| Yield/Force Off 170(s) | 32 | 75 | 32 | 75 |
| Local Start Time (s) | 0 | 36 | 0 | 36 |
| Local Yield (s) | 32 | 86 | 32 | 86 |
| Local Yield 170(s) | 32 | 75 | 32 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| 2 | 4 |
| 36 s | 54 s |
| 6 | 8 |
| 36 s | 54 s |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 183 | 316 | 17 | 56 | 171 | 71 | 53 | 225 | 133 | 108 | 176 | 136 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.97 | 0.98 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 199 | 343 | 18 | 61 | 186 | 77 | 58 | 245 | 145 | 117 | 191 | 148 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 509 | 1237 | 65 | 458 | 895 | 357 | 495 | 494 | 293 | 456 | 438 | 340 |
| Arrive On Green | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1112 | 3416 | 179 | 1001 | 2472 | 987 | 1031 | 1092 | 646 | 984 | 968 | 750 |
| Grp Volume(v), veh/h | 199 | 177 | 184 | 61 | 131 | 132 | 58 | 0 | 390 | 117 | 0 | 339 |
| Grp Sat Flow(s),veh/h/ln | 1112 | 1770 | 1825 | 1001 | 1770 | 1689 | 1031 | 0 | 1738 | 984 | 0 | 1718 |
| Q Serve(g_s), s | 6.5 | 3.1 | 3.1 | 2.0 | 2.2 | 2.3 | 1.8 | 0.0 | 6.8 | 4.1 | 0.0 | 5.8 |
| Cycle Q Clear(g_c), s | 8.9 | 3.1 | 3.1 | 5.1 | 2.2 | 2.3 | 7.6 | 0.0 | 6.8 | 11.0 | 0.0 | 5.8 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.58 | 1.00 | | 0.37 | 1.00 | | 0.44 |
| Lane Grp Cap(c), veh/h | 509 | 641 | 661 | 458 | 641 | 612 | 495 | 0 | 787 | 456 | 0 | 778 |
| V/C Ratio(X) | 0.39 | 0.28 | 0.28 | 0.13 | 0.20 | 0.22 | 0.12 | 0.00 | 0.50 | 0.26 | 0.00 | 0.44 |
| Avail Cap(c_a), veh/h | 1161 | 1678 | 1731 | 1044 | 1678 | 1601 | 1005 | 0 | 1648 | 944 | 0 | 1629 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.6 | 9.8 | 9.8 | 11.6 | 9.5 | 9.5 | 10.6 | 0.0 | 8.3 | 12.2 | 0.0 | 8.1 |
| Incr Delay (d2), s/veh | 0.5 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.5 | 0.3 | 0.0 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 1.5 | 1.6 | 0.6 | 1.1 | 1.1 | 0.5 | 0.0 | 3.4 | 1.1 | 0.0 | 2.8 |
| LnGrp Delay(d),s/veh | 13.1 | 10.0 | 10.0 | 11.7 | 9.7 | 9.7 | 10.8 | 0.0 | 8.8 | 12.5 | 0.0 | 8.5 |
| LnGrp LOS | B | B | B | B | A | A | B | | A | B | | A |
| Approach Vol, veh/h | 560 | | | 324 | | | | 448 | | | 456 | |
| Approach Delay, s/veh | 11.1 | | | 10.1 | | | | 9.1 | | | 9.5 | |
| Approach LOS | B | | | B | | | | A | | | A | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 23.6 | | 19.7 | | 23.6 | | 19.7 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 41.0 | | 41.0 | | 41.0 | | 41.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 9.6 | | 10.9 | | 13.0 | | 7.1 | | | | | |
| Green Ext Time (p_c), s | 6.8 | | 4.8 | | 6.6 | | 4.8 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 10.0 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 119 | 263 | 22 | 152 | 428 | 82 | 22 | 64 | 76 | 61 | 78 | 118 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 0.99 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 129 | 286 | 24 | 165 | 465 | 89 | 24 | 70 | 83 | 66 | 85 | 128 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 537 | 1589 | 132 | 666 | 1427 | 271 | 420 | 221 | 262 | 471 | 191 | 287 |
| Arrive On Green | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 |
| Sat Flow, veh/h | 851 | 3304 | 275 | 1057 | 2968 | 565 | 1155 | 772 | 915 | 1218 | 667 | 1004 |
| Grp Volume(v), veh/h | 129 | 152 | 158 | 165 | 276 | 278 | 24 | 0 | 153 | 66 | 0 | 213 |
| Grp Sat Flow(s),veh/h/ln | 851 | 1770 | 1810 | 1057 | 1770 | 1763 | 1155 | 0 | 1687 | 1218 | 0 | 1671 |
| Q Serve(g_s), s | 3.8 | 1.7 | 1.7 | 3.6 | 3.3 | 3.3 | 0.6 | 0.0 | 2.4 | 1.5 | 0.0 | 3.6 |
| Cycle Q Clear(g_c), s | 7.1 | 1.7 | 1.7 | 5.3 | 3.3 | 3.3 | 4.2 | 0.0 | 2.4 | 4.0 | 0.0 | 3.6 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.32 | 1.00 | | 0.54 | 1.00 | | 0.60 |
| Lane Grp Cap(c), veh/h | 537 | 851 | 870 | 666 | 851 | 848 | 420 | 0 | 482 | 471 | 0 | 477 |
| V/C Ratio(X) | 0.24 | 0.18 | 0.18 | 0.25 | 0.32 | 0.33 | 0.06 | 0.00 | 0.32 | 0.14 | 0.00 | 0.45 |
| Avail Cap(c_a), veh/h | 1344 | 2530 | 2588 | 1669 | 2530 | 2521 | 1202 | 0 | 1625 | 1296 | 0 | 1609 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 7.7 | 5.1 | 5.1 | 6.6 | 5.5 | 5.5 | 11.7 | 0.0 | 9.6 | 11.2 | 0.0 | 10.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.0 | 0.4 | 0.1 | 0.0 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.8 | 0.9 | 1.0 | 1.6 | 1.6 | 0.2 | 0.0 | 1.2 | 0.5 | 0.0 | 1.7 |
| LnGrp Delay(d),s/veh | 7.9 | 5.2 | 5.2 | 6.8 | 5.7 | 5.7 | 11.8 | 0.0 | 10.0 | 11.3 | 0.0 | 10.7 |
| LnGrp LOS | A | A | A | A | A | A | B | | A | B | | B |
| Approach Vol, veh/h | 439 | | | 719 | | | | 177 | | | 279 | |
| Approach Delay, s/veh | 6.0 | | | 5.9 | | | | 10.2 | | | 10.8 | |
| Approach LOS | A | | | A | | | | B | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 13.8 | | 20.5 | | 13.8 | | 20.5 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 33.0 | | 49.0 | | 33.0 | | 49.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 6.2 | | 9.1 | | 6.0 | | 7.3 | | | | | |
| Green Ext Time (p_c), s | 2.9 | | 7.4 | | 2.9 | | 7.4 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 7.3 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 45 | 45 | 45 | 45 |
| Maximum Split (%) | 50.0% | 50.0% | 50.0% | 50.0% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 45 | 0 | 45 |
| End Time (s) | 45 | 0 | 45 | 0 |
| Yield/Force Off (s) | 41 | 86 | 41 | 86 |
| Yield/Force Off 170(s) | 41 | 75 | 41 | 75 |
| Local Start Time (s) | 0 | 45 | 0 | 45 |
| Local Yield (s) | 41 | 86 | 41 | 86 |
| Local Yield 170(s) | 41 | 75 | 41 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| 2 | 4 |
| 45 s | 45 s |
| 6 | 8 |
| 45 s | 45 s |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 37 | 53 | 37 | 53 |
| Maximum Split (%) | 41.1% | 58.9% | 41.1% | 58.9% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 37 | 0 | 37 |
| End Time (s) | 37 | 0 | 37 | 0 |
| Yield/Force Off (s) | 33 | 86 | 33 | 86 |
| Yield/Force Off 170(s) | 33 | 75 | 33 | 75 |
| Local Start Time (s) | 0 | 37 | 0 | 37 |
| Local Yield (s) | 33 | 86 | 33 | 86 |
| Local Yield 170(s) | 33 | 75 | 33 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| 2 | 4 |
| 37 s | 53 s |
| 6 | 8 |
| 37 s | 53 s |

APPENDIX E

2026 TOTAL PEAK HOUR CAPACITY ANALYSIS

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.994 | | | 0.962 | | | 0.942 | | | 0.961 | | |
| Fit Protected | 0.950 | | 0.950 | | 0.950 | | | | | 0.986 | | |
| Satd. Flow (prot) | 1770 | 3518 | 0 | 1770 | 3405 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Fit Permitted | 0.950 | | 0.950 | | 0.950 | | | | | 0.986 | | |
| Satd. Flow (perm) | 1770 | 3518 | 0 | 1770 | 3405 | 0 | 1770 | 1755 | 0 | 0 | 1765 | 0 |
| Link Speed (mph) | 45 | | | 45 | | | 25 | | | 25 | | |
| Link Distance (ft) | 500 | | | 200 | | | 500 | | | 500 | | |
| Travel Time (s) | 7.6 | | | 3.0 | | | 13.6 | | | 13.6 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 95 | 0 | 100 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.990 | | | 0.980 | | | 0.913 | | | 0.942 | | |
| Fit Protected | 0.950 | | 0.950 | | 0.950 | | | | | 0.986 | | |
| Satd. Flow (prot) | 1770 | 3504 | 0 | 1770 | 3468 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Fit Permitted | 0.950 | | 0.950 | | 0.950 | | | | | 0.986 | | |
| Satd. Flow (perm) | 1770 | 3504 | 0 | 1770 | 3468 | 0 | 1770 | 1701 | 0 | 0 | 1730 | 0 |
| Link Speed (mph) | 45 | | | 45 | | | 25 | | | 25 | | |
| Link Distance (ft) | 500 | | | 200 | | | 500 | | | 500 | | |
| Travel Time (s) | 7.6 | | | 3.0 | | | 13.6 | | | 13.6 | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 49.4 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 151 | 384 | 17 | 0 | 56 | 208 | 71 | 0 | 53 | 209 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 164 | 417 | 18 | 0 | 61 | 226 | 77 | 0 | 58 | 227 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 29.6 | 20.5 | 71.1 |
| HCM LOS | D | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|-------|-------|--------|-------|-------|--------|--------|--------|--------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 28% |
| Vol Thru, % | 0% | 61% | 0% | 100% | 88% | 0% | 100% | 49% | 43% |
| Vol Right, % | 0% | 39% | 0% | 0% | 12% | 0% | 0% | 51% | 29% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 342 | 151 | 256 | 145 | 56 | 139 | 140 | 381 |
| LT Vol | 0 | 209 | 0 | 256 | 128 | 0 | 139 | 69 | 163 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 110 |
| RT Vol | 53 | 0 | 151 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 372 | 164 | 278 | 158 | 61 | 151 | 153 | 414 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.171 | 1 | 0.477 | 0.77 | 0.433 | 0.189 | 0.447 | 0.437 | 1 |
| Departure Headway (Hd) | 10.7 | 9.933 | 10.459 | 9.961 | 9.879 | 11.175 | 10.677 | 10.324 | 10.197 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 336 | 368 | 346 | 365 | 366 | 322 | 339 | 351 | 356 |
| Service Time | 8.446 | 7.679 | 8.183 | 7.685 | 7.603 | 8.902 | 8.404 | 8.051 | 7.945 |
| HCM Lane V/C Ratio | 0.173 | 1.011 | 0.474 | 0.762 | 0.432 | 0.189 | 0.445 | 0.436 | 1.163 |
| HCM Control Delay | 15.6 | 79.7 | 22.4 | 39.3 | 20 | 16.5 | 21.8 | 20.8 | 80.8 |
| HCM Lane LOS | C | F | C | E | C | C | C | C | F |
| HCM 95th-tile Q | 0.6 | 11.6 | 2.5 | 6.3 | 2.1 | 0.7 | 2.2 | 2.1 | 11.5 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 27 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 100 | 320 | 22 | 0 | 152 | 521 | 82 | 0 | 22 | 55 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 109 | 348 | 24 | 0 | 165 | 566 | 89 | 0 | 24 | 60 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|----|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 19.8 | 33 | 17.8 |
| HCM LOS | C | D | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 27% |
| Vol Thru, % | 0% | 42% | 0% | 100% | 83% | 0% | 100% | 68% | 30% |
| Vol Right, % | 0% | 58% | 0% | 0% | 17% | 0% | 0% | 32% | 43% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 131 | 100 | 213 | 129 | 152 | 347 | 256 | 222 |
| LT Vol | 0 | 55 | 0 | 213 | 107 | 0 | 347 | 174 | 66 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 95 |
| RT Vol | 22 | 0 | 100 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 142 | 109 | 232 | 140 | 165 | 378 | 278 | 241 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.071 | 0.383 | 0.287 | 0.58 | 0.345 | 0.406 | 0.873 | 0.625 | 0.633 |
| Departure Headway (Hd) | 10.627 | 9.692 | 9.519 | 9 | 8.876 | 8.845 | 8.327 | 8.094 | 9.437 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 336 | 370 | 377 | 401 | 404 | 406 | 434 | 445 | 381 |
| Service Time | 8.414 | 7.478 | 7.293 | 6.773 | 6.649 | 6.611 | 6.093 | 5.86 | 7.213 |
| HCM Lane V/C Ratio | 0.071 | 0.384 | 0.289 | 0.579 | 0.347 | 0.406 | 0.871 | 0.625 | 0.633 |
| HCM Control Delay | 14.2 | 18.4 | 16.1 | 23.6 | 16.3 | 17.6 | 46.7 | 23.5 | 27.3 |
| HCM Lane LOS | B | C | C | C | C | C | E | C | D |
| HCM 95th-tile Q | 0.2 | 1.8 | 1.2 | 3.5 | 1.5 | 1.9 | 8.9 | 4.2 | 4.2 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 163 | 110 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 177 | 120 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 80.8 | | |
| HCM LOS | | F | | |
| Lane | | | | |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 66 | 95 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 72 | 103 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 27.3 | | |
| HCM LOS | | D | | |
| Lane | | | | |

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 95 | 0 | 0 | 100 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.994 | | | 0.962 | | | 0.949 | | | 0.949 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.989 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 3518 | 0 | 1770 | 3405 | 0 | 1770 | 1768 | 0 | 0 | 1748 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.989 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 3518 | 0 | 1770 | 3405 | 0 | 1770 | 1768 | 0 | 0 | 1748 | 0 |
| Link Speed (mph) | 45 | | | 45 | | | 25 | | | 25 | | |
| Link Distance (ft) | 500 | | | 200 | | | 500 | | | 500 | | |
| Travel Time (s) | 7.6 | | | 3.0 | | | 13.6 | | | 13.6 | | |

Intersection Summary

Area Type: Other

Lanes and Geometrics

1: 6/26/2015

| 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 |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Grade (%) | 0% | | | 0% | | | 0% | | | 0% | | |
| Storage Length (ft) | 95 | 0 | 0 | 100 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 |
| Storage Lanes | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Taper Length (ft) | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.990 | | | 0.980 | | | 0.928 | | | 0.932 | | |
| Flt Protected | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.991 | 0 | 0 |
| Satd. Flow (prot) | 1770 | 3504 | 0 | 1770 | 3468 | 0 | 1770 | 1729 | 0 | 0 | 1720 | 0 |
| Flt Permitted | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.950 | 0 | 0 | 0.991 | 0 | 0 |
| Satd. Flow (perm) | 1770 | 3504 | 0 | 1770 | 3468 | 0 | 1770 | 1729 | 0 | 0 | 1720 | 0 |
| Link Speed (mph) | 45 | | | 45 | | | 25 | | | 25 | | |
| Link Distance (ft) | 500 | | | 200 | | | 500 | | | 500 | | |
| Travel Time (s) | 7.6 | | | 3.0 | | | 13.6 | | | 13.6 | | |

Intersection Summary

Area Type: Other

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 53.8 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 245 | 384 | 17 | 0 | 56 | 208 | 71 | 0 | 53 | 256 | 133 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 266 | 417 | 18 | 0 | 61 | 226 | 77 | 0 | 58 | 278 | 145 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 35.6 | 21.4 | 73.4 |
| HCM LOS | E | C | F |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|--------|-------|--------|-------|--------|--------|--------|--------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 22% |
| Vol Thru, % | 0% | 66% | 0% | 100% | 88% | 0% | 100% | 49% | 41% |
| Vol Right, % | 0% | 34% | 0% | 0% | 12% | 0% | 0% | 51% | 38% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 53 | 389 | 245 | 256 | 145 | 56 | 139 | 140 | 496 |
| LT Vol | 0 | 256 | 0 | 256 | 128 | 0 | 139 | 69 | 201 |
| Through Vol | 0 | 133 | 0 | 0 | 17 | 0 | 0 | 71 | 187 |
| RT Vol | 53 | 0 | 245 | 0 | 0 | 56 | 0 | 0 | 108 |
| Lane Flow Rate | 58 | 423 | 266 | 278 | 158 | 61 | 151 | 153 | 539 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.177 | 1 | 0.771 | 0.767 | 0.431 | 0.194 | 0.46 | 0.45 | 1 |
| Departure Headway (Hd) | 11.055 | 10.321 | 10.53 | 10.031 | 9.95 | 11.483 | 10.985 | 10.632 | 10.472 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 326 | 355 | 346 | 362 | 364 | 314 | 330 | 340 | 350 |
| Service Time | 8.77 | 8.036 | 8.23 | 7.731 | 7.65 | 9.185 | 8.687 | 8.335 | 8.19 |
| HCM Lane V/C Ratio | 0.178 | 1.192 | 0.769 | 0.768 | 0.434 | 0.194 | 0.458 | 0.45 | 1.54 |
| HCM Control Delay | 16.1 | 81.2 | 41.1 | 39.1 | 20 | 16.9 | 22.7 | 21.8 | 81.9 |
| HCM Lane LOS | C | F | E | E | C | C | C | C | F |
| HCM 95th-tile Q | 0.6 | 11.4 | 6.2 | 6.2 | 2.1 | 0.7 | 2.3 | 2.2 | 11.3 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Intersection Delay, s/veh | 46.7 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
| Vol, veh/h | 0 | 153 | 320 | 22 | 0 | 152 | 521 | 82 | 0 | 22 | 82 | 76 |
| 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 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 166 | 348 | 24 | 0 | 165 | 566 | 89 | 0 | 24 | 89 | 83 |
| Number of Lanes | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB |
|----------------------------|------|------|------|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 3 | 3 | 1 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 1 | 2 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 2 | 1 | 3 |
| HCM Control Delay | 25.3 | 51.2 | 24.4 |
| HCM LOS | D | F | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 |
|------------------------|--------|--------|-------|--------|--------|--------|-------|-------|--------|
| Vol Left, % | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 19% |
| Vol Thru, % | 0% | 52% | 0% | 100% | 83% | 0% | 100% | 68% | 31% |
| Vol Right, % | 0% | 48% | 0% | 0% | 17% | 0% | 0% | 32% | 50% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 22 | 158 | 153 | 213 | 129 | 152 | 347 | 256 | 324 |
| LT Vol | 0 | 82 | 0 | 213 | 107 | 0 | 347 | 174 | 100 |
| Through Vol | 0 | 76 | 0 | 0 | 22 | 0 | 0 | 82 | 163 |
| RT Vol | 22 | 0 | 153 | 0 | 0 | 152 | 0 | 0 | 61 |
| Lane Flow Rate | 24 | 172 | 166 | 232 | 140 | 165 | 378 | 278 | 352 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.079 | 0.531 | 0.494 | 0.657 | 0.392 | 0.464 | 1 | 0.724 | 1 |
| Departure Headway (Hd) | 11.953 | 11.122 | 10.7 | 10.202 | 10.082 | 10.106 | 9.608 | 9.384 | 10.393 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 303 | 328 | 339 | 357 | 361 | 360 | 381 | 389 | 352 |
| Service Time | 9.589 | 8.758 | 8.366 | 7.867 | 7.748 | 7.756 | 7.257 | 7.034 | 8.035 |
| HCM Lane V/C Ratio | 0.079 | 0.524 | 0.49 | 0.65 | 0.388 | 0.458 | 0.992 | 0.715 | 1 |
| HCM Control Delay | 15.6 | 25.6 | 23.3 | 30.4 | 19.1 | 21.2 | 77.8 | 33 | 81.2 |
| HCM Lane LOS | C | D | C | D | C | C | F | D | F |
| HCM 95th-tile Q | 0.3 | 2.9 | 2.6 | 4.4 | 1.8 | 2.4 | 11.9 | 5.6 | 11.4 |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 108 | 201 | 187 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 117 | 218 | 203 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 81.9 | | |
| HCM LOS | | F | | |
| Lane | | | | |

HCM 2010 AWSC

1:

6/26/2015

| Intersection | | | | |
|----------------------------|------|------|------|------|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |
| Movement | SBU | SBL | SBT | SBR |
| Vol, veh/h | 0 | 61 | 100 | 163 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 66 | 109 | 177 |
| Number of Lanes | 0 | 0 | 1 | 0 |
| Approach | | SB | | |
| Opposing Approach | | NB | | |
| Opposing Lanes | | 2 | | |
| Conflicting Approach Left | | WB | | |
| Conflicting Lanes Left | | 3 | | |
| Conflicting Approach Right | | EB | | |
| Conflicting Lanes Right | | 3 | | |
| HCM Control Delay | | 81.2 | | |
| HCM LOS | | F | | |
| Lane | | | | |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 151 | 384 | 17 | 56 | 208 | 71 | 53 | 209 | 133 | 108 | 163 | 110 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.97 | 0.99 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 164 | 417 | 18 | 61 | 226 | 77 | 58 | 227 | 145 | 117 | 177 | 120 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 500 | 1267 | 55 | 435 | 959 | 318 | 521 | 467 | 298 | 461 | 455 | 308 |
| Arrive On Green | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1072 | 3453 | 149 | 937 | 2613 | 867 | 1070 | 1057 | 675 | 1000 | 1030 | 698 |
| Grp Volume(v), veh/h | 164 | 213 | 222 | 61 | 151 | 152 | 58 | 0 | 372 | 117 | 0 | 297 |
| Grp Sat Flow(s),veh/h/ln | 1072 | 1770 | 1832 | 937 | 1770 | 1710 | 1070 | 0 | 1733 | 1000 | 0 | 1728 |
| Q Serve(g_s), s | 5.2 | 3.6 | 3.6 | 2.1 | 2.5 | 2.6 | 1.6 | 0.0 | 6.4 | 3.9 | 0.0 | 4.8 |
| Cycle Q Clear(g_c), s | 7.8 | 3.6 | 3.6 | 5.7 | 2.5 | 2.6 | 6.5 | 0.0 | 6.4 | 10.3 | 0.0 | 4.8 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.51 | 1.00 | | 0.39 | 1.00 | | 0.40 |
| Lane Grp Cap(c), veh/h | 500 | 649 | 672 | 435 | 649 | 627 | 521 | 0 | 765 | 461 | 0 | 763 |
| V/C Ratio(X) | 0.33 | 0.33 | 0.33 | 0.14 | 0.23 | 0.24 | 0.11 | 0.00 | 0.49 | 0.25 | 0.00 | 0.39 |
| Avail Cap(c_a), veh/h | 1107 | 1653 | 1711 | 966 | 1653 | 1597 | 1150 | 0 | 1784 | 1050 | 0 | 1780 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.9 | 9.5 | 9.5 | 11.6 | 9.1 | 9.2 | 10.0 | 0.0 | 8.3 | 12.0 | 0.0 | 7.9 |
| Incr Delay (d2), s/veh | 0.4 | 0.3 | 0.3 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.5 | 0.3 | 0.0 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 1.8 | 1.9 | 0.6 | 1.2 | 1.2 | 0.5 | 0.0 | 3.1 | 1.1 | 0.0 | 2.4 |
| LnGrp Delay(d),s/veh | 12.3 | 9.8 | 9.8 | 11.7 | 9.3 | 9.4 | 10.1 | 0.0 | 8.8 | 12.2 | 0.0 | 8.2 |
| LnGrp LOS | B | A | A | B | A | A | B | | A | B | | A |
| Approach Vol, veh/h | 599 | | | 364 | | | 430 | | | 414 | | |
| Approach Delay, s/veh | 10.5 | | | 9.8 | | | 9.0 | | | 9.3 | | |
| Approach LOS | B | | | A | | | A | | | A | | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 22.4 | | 19.3 | | 22.4 | | 19.3 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 43.0 | | 39.0 | | 43.0 | | 39.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 8.5 | | 9.8 | | 12.3 | | 7.7 | | | | | |
| Green Ext Time (p_c), s | 6.3 | | 5.4 | | 6.1 | | 5.5 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 9.7 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 100 | 320 | 22 | 152 | 521 | 82 | 22 | 55 | 76 | 61 | 66 | 95 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 0.99 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 109 | 348 | 24 | 165 | 566 | 89 | 24 | 60 | 83 | 66 | 72 | 103 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 514 | 1728 | 119 | 659 | 1578 | 247 | 411 | 184 | 255 | 438 | 180 | 258 |
| Arrive On Green | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Sat Flow, veh/h | 775 | 3358 | 230 | 1000 | 3067 | 481 | 1194 | 703 | 972 | 1228 | 688 | 985 |
| Grp Volume(v), veh/h | 109 | 183 | 189 | 165 | 326 | 329 | 24 | 0 | 143 | 66 | 0 | 175 |
| Grp Sat Flow(s),veh/h/ln | 775 | 1770 | 1819 | 1000 | 1770 | 1778 | 1194 | 0 | 1675 | 1228 | 0 | 1673 |
| Q Serve(g_s), s | 3.5 | 2.0 | 2.0 | 3.8 | 3.9 | 3.9 | 0.6 | 0.0 | 2.5 | 1.6 | 0.0 | 3.1 |
| Cycle Q Clear(g_c), s | 7.4 | 2.0 | 2.0 | 5.9 | 3.9 | 3.9 | 3.7 | 0.0 | 2.5 | 4.1 | 0.0 | 3.1 |
| Prop In Lane | 1.00 | | 0.13 | 1.00 | | 0.27 | 1.00 | | 0.58 | 1.00 | | 0.59 |
| Lane Grp Cap(c), veh/h | 514 | 910 | 936 | 659 | 910 | 915 | 411 | 0 | 439 | 438 | 0 | 438 |
| V/C Ratio(X) | 0.21 | 0.20 | 0.20 | 0.25 | 0.36 | 0.36 | 0.06 | 0.00 | 0.33 | 0.15 | 0.00 | 0.40 |
| Avail Cap(c_a), veh/h | 1242 | 2571 | 2643 | 1598 | 2571 | 2583 | 1099 | 0 | 1404 | 1146 | 0 | 1402 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 7.4 | 4.7 | 4.7 | 6.3 | 5.2 | 5.2 | 12.4 | 0.0 | 10.7 | 12.3 | 0.0 | 10.9 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.0 | 0.4 | 0.2 | 0.0 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 1.0 | 1.0 | 1.1 | 2.0 | 2.0 | 0.2 | 0.0 | 1.2 | 0.6 | 0.0 | 1.5 |
| LnGrp Delay(d),s/veh | 7.6 | 4.8 | 4.8 | 6.5 | 5.4 | 5.4 | 12.5 | 0.0 | 11.1 | 12.5 | 0.0 | 11.5 |
| LnGrp LOS | A | A | A | A | A | A | B | | B | B | | B |
| Approach Vol, veh/h | 481 | | | 820 | | | 167 | | | 241 | | |
| Approach Delay, s/veh | 5.4 | | | 5.6 | | | 11.3 | | | 11.7 | | |
| Approach LOS | A | | | A | | | B | | | B | | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 13.4 | | 22.4 | | 13.4 | | 22.4 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 30.0 | | 52.0 | | 30.0 | | 52.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 5.7 | | 9.4 | | 6.1 | | 7.9 | | | | | |
| Green Ext Time (p_c), s | 2.4 | | 9.0 | | 2.4 | | 9.0 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 7.0 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 47 | 43 | 47 | 43 |
| Maximum Split (%) | 52.2% | 47.8% | 52.2% | 47.8% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 47 | 0 | 47 |
| End Time (s) | 47 | 0 | 47 | 0 |
| Yield/Force Off (s) | 43 | 86 | 43 | 86 |
| Yield/Force Off 170(s) | 43 | 75 | 43 | 75 |
| Local Start Time (s) | 0 | 47 | 0 | 47 |
| Local Yield (s) | 43 | 86 | 43 | 86 |
| Local Yield 170(s) | 43 | 75 | 43 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| φ2 | φ4 |
| 47 s | 43 s |
| φ6 | φ8 |
| 47 s | 43 s |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 34 | 56 | 34 | 56 |
| Maximum Split (%) | 37.8% | 62.2% | 37.8% | 62.2% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 34 | 0 | 34 |
| End Time (s) | 34 | 0 | 34 | 0 |
| Yield/Force Off (s) | 30 | 86 | 30 | 86 |
| Yield/Force Off 170(s) | 30 | 75 | 30 | 75 |
| Local Start Time (s) | 0 | 34 | 0 | 34 |
| Local Yield (s) | 30 | 86 | 30 | 86 |
| Local Yield 170(s) | 30 | 75 | 30 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| φ2 | φ4 |
| 34 s | 56 s |
| φ6 | φ8 |
| 34 s | 56 s |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 245 | 384 | 17 | 56 | 208 | 71 | 53 | 256 | 133 | 108 | 201 | 187 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 0.99 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 266 | 417 | 18 | 61 | 226 | 77 | 58 | 278 | 145 | 117 | 218 | 203 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 511 | 1426 | 61 | 442 | 1079 | 358 | 379 | 509 | 265 | 383 | 391 | 364 |
| Arrive On Green | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1072 | 3453 | 149 | 940 | 2613 | 867 | 959 | 1148 | 599 | 957 | 883 | 822 |
| Grp Volume(v), veh/h | 266 | 213 | 222 | 61 | 151 | 152 | 58 | 0 | 423 | 117 | 0 | 421 |
| Grp Sat Flow(s),veh/h/ln | 1072 | 1770 | 1832 | 940 | 1770 | 1710 | 959 | 0 | 1747 | 957 | 0 | 1704 |
| Q Serve(g_s), s | 11.8 | 4.5 | 4.5 | 2.6 | 3.0 | 3.2 | 2.6 | 0.0 | 9.9 | 5.7 | 0.0 | 10.1 |
| Cycle Q Clear(g_c), s | 15.0 | 4.5 | 4.5 | 7.1 | 3.0 | 3.2 | 12.8 | 0.0 | 9.9 | 15.6 | 0.0 | 10.1 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.51 | 1.00 | | 0.34 | 1.00 | | 0.48 |
| Lane Grp Cap(c), veh/h | 511 | 731 | 756 | 442 | 731 | 706 | 379 | 0 | 774 | 383 | 0 | 755 |
| V/C Ratio(X) | 0.52 | 0.29 | 0.29 | 0.14 | 0.21 | 0.22 | 0.15 | 0.00 | 0.55 | 0.31 | 0.00 | 0.56 |
| Avail Cap(c_a), veh/h | 918 | 1403 | 1452 | 799 | 1403 | 1355 | 611 | 0 | 1196 | 615 | 0 | 1167 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.3 | 10.9 | 10.9 | 13.2 | 10.5 | 10.5 | 16.2 | 0.0 | 11.4 | 17.1 | 0.0 | 11.4 |
| Incr Delay (d2), s/veh | 0.8 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.0 | 0.6 | 0.4 | 0.0 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 2.2 | 2.3 | 0.7 | 1.5 | 1.5 | 0.7 | 0.0 | 4.8 | 1.5 | 0.0 | 4.8 |
| LnGrp Delay(d),s/veh | 16.1 | 11.1 | 11.1 | 13.4 | 10.6 | 10.6 | 16.3 | 0.0 | 12.0 | 17.5 | 0.0 | 12.1 |
| LnGrp LOS | B | B | B | B | B | B | B | | B | B | | B |
| Approach Vol, veh/h | 701 | | | 364 | | | | 481 | | | 538 | |
| Approach Delay, s/veh | 13.0 | | | 11.1 | | | | 12.5 | | | 13.3 | |
| Approach LOS | B | | | B | | | | B | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 28.6 | | 26.9 | | 28.6 | | 26.9 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 38.0 | | 44.0 | | 38.0 | | 44.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 14.8 | | 17.0 | | 17.6 | | 9.1 | | | | | |
| Green Ext Time (p_c), s | 7.4 | | 5.9 | | 7.0 | | 6.2 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 12.6 | | | | | | | | | | | |
| HCM 2010 LOS | B | | | | | | | | | | | |

HCM 2010 Signalized Intersection Summary

1:

7/10/2015

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ | ↔ | ↕ | ↔ |
| Volume (veh/h) | 153 | 320 | 22 | 152 | 521 | 82 | 22 | 82 | 76 | 61 | 100 | 163 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Ob), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 0.99 | | 1.00 | 0.99 | | 0.99 | 0.99 | | 0.99 |
| Parking Bus, 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 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 166 | 348 | 24 | 165 | 566 | 89 | 24 | 89 | 83 | 66 | 109 | 177 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 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 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 484 | 1762 | 121 | 631 | 1609 | 252 | 324 | 261 | 244 | 421 | 188 | 305 |
| Arrive On Green | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| Sat Flow, veh/h | 775 | 3358 | 230 | 1000 | 3067 | 481 | 1082 | 883 | 823 | 1198 | 635 | 1031 |
| Grp Volume(v), veh/h | 166 | 183 | 189 | 165 | 326 | 329 | 24 | 0 | 172 | 66 | 0 | 286 |
| Grp Sat Flow(s),veh/h/ln | 775 | 1770 | 1819 | 1000 | 1770 | 1778 | 1082 | 0 | 1706 | 1198 | 0 | 1666 |
| Q Serve(g_s), s | 7.1 | 2.4 | 2.5 | 4.7 | 4.8 | 4.8 | 0.9 | 0.0 | 3.5 | 2.0 | 0.0 | 6.5 |
| Cycle Q Clear(g_c), s | 11.9 | 2.4 | 2.5 | 7.1 | 4.8 | 4.8 | 7.4 | 0.0 | 3.5 | 5.6 | 0.0 | 6.5 |
| Prop In Lane | 1.00 | | 0.13 | 1.00 | | 0.27 | 1.00 | | 0.48 | 1.00 | | 0.62 |
| Lane Grp Cap(c), veh/h | 484 | 928 | 954 | 631 | 928 | 933 | 324 | 0 | 505 | 421 | 0 | 493 |
| V/C Ratio(X) | 0.34 | 0.20 | 0.20 | 0.26 | 0.35 | 0.35 | 0.07 | 0.00 | 0.34 | 0.16 | 0.00 | 0.58 |
| Avail Cap(c_a), veh/h | 981 | 2063 | 2120 | 1272 | 2063 | 2072 | 731 | 0 | 1147 | 872 | 0 | 1120 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 9.7 | 5.6 | 5.6 | 7.5 | 6.2 | 6.2 | 16.5 | 0.0 | 12.3 | 14.5 | 0.0 | 13.3 |
| Incr Delay (d2), s/veh | 0.4 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.0 | 0.4 | 0.2 | 0.0 | 1.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 1.2 | 1.2 | 1.3 | 2.3 | 2.3 | 0.3 | 0.0 | 1.7 | 0.7 | 0.0 | 3.1 |
| LnGrp Delay(d),s/veh | 10.1 | 5.7 | 5.7 | 7.7 | 6.4 | 6.4 | 16.6 | 0.0 | 12.7 | 14.6 | 0.0 | 14.4 |
| LnGrp LOS | B | A | A | A | A | A | B | | B | B | | B |
| Approach Vol, veh/h | 538 | | | 820 | | | | 196 | | | 352 | |
| Approach Delay, s/veh | 7.1 | | | 6.7 | | | | 13.2 | | | 14.5 | |
| Approach LOS | A | | | A | | | | B | | | B | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 2 | | 4 | | 6 | | 8 | | | | | |
| Phs Duration (G+Y+Rc), s | 17.2 | | 27.4 | | 17.2 | | 27.4 | | | | | |
| Change Period (Y+Rc), s | 4.0 | | 4.0 | | 4.0 | | 4.0 | | | | | |
| Max Green Setting (Gmax), s | 30.0 | | 52.0 | | 30.0 | | 52.0 | | | | | |
| Max Q Clear Time (g_c+I1), s | 9.4 | | 13.9 | | 8.5 | | 9.1 | | | | | |
| Green Ext Time (p_c), s | 3.4 | | 9.5 | | 3.4 | | 9.7 | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | 8.9 | | | | | | | | | | | |
| HCM 2010 LOS | A | | | | | | | | | | | |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 42 | 48 | 42 | 48 |
| Maximum Split (%) | 46.7% | 53.3% | 46.7% | 53.3% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 42 | 0 | 42 |
| End Time (s) | 42 | 0 | 42 | 0 |
| Yield/Force Off (s) | 38 | 86 | 38 | 86 |
| Yield/Force Off 170(s) | 38 | 75 | 38 | 75 |
| Local Start Time (s) | 0 | 42 | 0 | 42 |
| Local Yield (s) | 38 | 86 | 38 | 86 |
| Local Yield 170(s) | 38 | 75 | 38 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 40 |

Splits and Phases: 1:

| | |
|------|------|
| φ2 | φ4 |
| 42 s | 48 s |
| φ6 | φ8 |
| 42 s | 48 s |

Timing Report, Sorted By Phase

1:

7/10/2015



| Phase Number | 2 | 4 | 6 | 8 |
|------------------------|-------|-------|-------|-------|
| Movement | NBTL | EBTL | SBTL | WBTL |
| Lead/Lag | | | | |
| Lead-Lag Optimize | | | | |
| Recall Mode | Min | None | Min | None |
| Maximum Split (s) | 34 | 56 | 34 | 56 |
| Maximum Split (%) | 37.8% | 62.2% | 37.8% | 62.2% |
| Minimum Split (s) | 20 | 20 | 20 | 20 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 |
| Minimum Initial (s) | 4 | 4 | 4 | 4 |
| Vehicle Extension (s) | 3 | 3 | 3 | 3 |
| Minimum Gap (s) | 3 | 3 | 3 | 3 |
| Time Before Reduce (s) | 0 | 0 | 0 | 0 |
| Time To Reduce (s) | 0 | 0 | 0 | 0 |
| Walk Time (s) | 5 | 5 | 5 | 5 |
| Flash Dont Walk (s) | 11 | 11 | 11 | 11 |
| Dual Entry | Yes | Yes | Yes | Yes |
| Inhibit Max | Yes | Yes | Yes | Yes |
| Start Time (s) | 0 | 34 | 0 | 34 |
| End Time (s) | 34 | 0 | 34 | 0 |
| Yield/Force Off (s) | 30 | 86 | 30 | 86 |
| Yield/Force Off 170(s) | 30 | 75 | 30 | 75 |
| Local Start Time (s) | 0 | 34 | 0 | 34 |
| Local Yield (s) | 30 | 86 | 30 | 86 |
| Local Yield 170(s) | 30 | 75 | 30 | 75 |

Intersection Summary

| | |
|---------------|------------------------|
| Cycle Length | 90 |
| Control Type | Actuated-Uncoordinated |
| Natural Cycle | 45 |

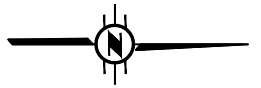
Splits and Phases: 1:

| | |
|------|------|
| φ2 | φ4 |
| 34 s | 56 s |
| φ6 | φ8 |
| 34 s | 56 s |

FD AC FLUSH
WITH PAVEMENT
LS19817 2012

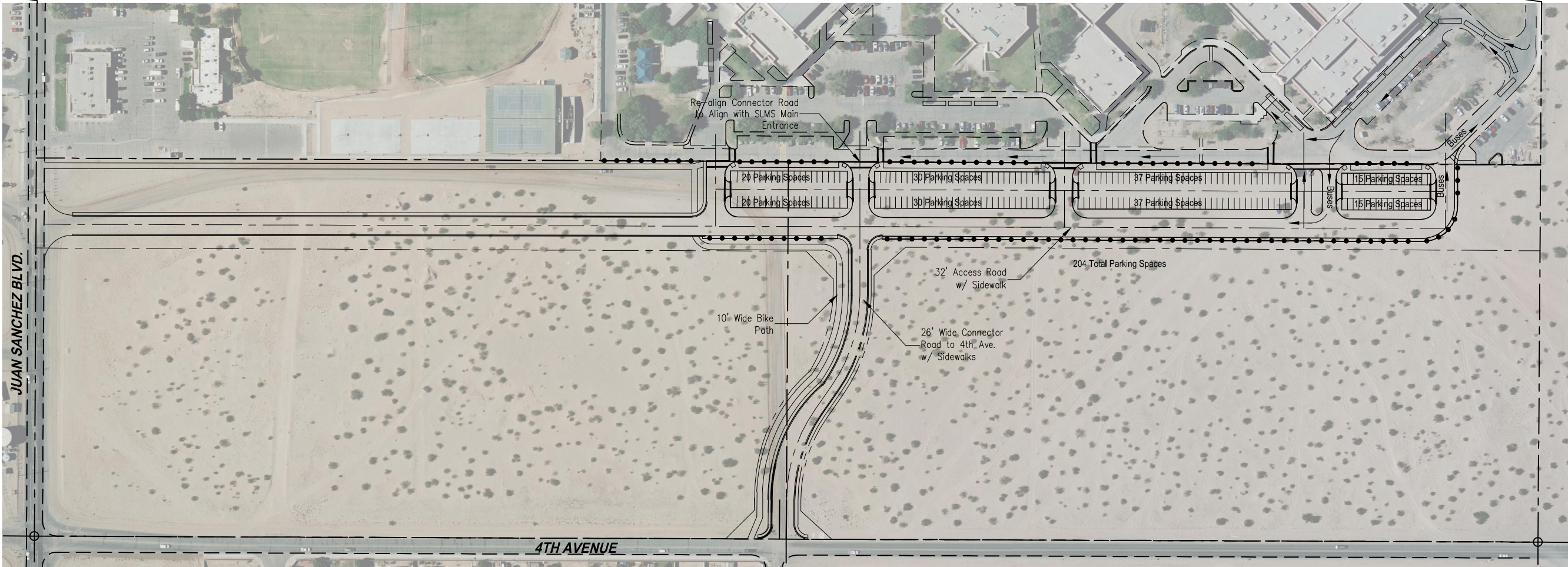
N0°26'35"E 2641.35'(M) 2640.00'(R4)

FD BC IN HH



0 100' 200'

SCALE: 1" = 100'



**JAMES DAVEY AND ASSOCIATES
CONSULTING CIVIL ENGINEERS**
1025 W. 24th Street, Ste. #2 - YUMA, AZ 85364 - (928) 782-7926

**GADSDEN ELEMENTARY SCHOOL DISTRICT
ARIZONA DESERT ELEMENTARY SCHOOL
SAN LUIS MIDDLE SCHOOL**

**CONCEPTUAL LAYOUT OF ACCESS
ROADS AND PARKING
ALTERNATIVE 4**

PREPARED FOR:
GADSDEN ELEMENTARY
SCHOOL DISTRICT #32
1453 N. MAIN STREET
SAN LUIS, AZ 85349

DESIGNED BY: J.V.D.

DRAWN BY: O.J.Z.

APPROVED BY: J.V.D.

SHEET C-1

SEPTEMBER 24, 2015



GSD-01



AGENDA ITEM REVIEW FORM

City Council Work Session

3. C.

Meeting Date: 10/21/2015

Department Head: Jenny Torres, Community Development Director, Community Development Department

Submitted By: Dania Castillo, Economic Development Assistant, Community Development Department

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding the proposed downtown plan during agricultural season.
(Jenny Torres, Community Development Director)

SUMMARY:

City staff presented at the 10th Annual Arizona/California Agricultural Employer Seminar. Staff presented the new downtown project and the issues that the City is having with littering, parking, lack of restroom facilities, traffic and safety issues. Agricultural employers provided the City with some possible solutions and a second presentation will be conducted on October 20th to present a plan. The plan includes the following:

- Potential bus routes and pick up and drop off locations (eventually will need to be become official)
- Proposal to increase the business license fee for agricultural companies to pay for restrooms/maintenance of portable potties at friendship park
- Ordinance enforcing the bus routes, business littering, and portable potties
- Leasing locations to store busses and provide parking for their employees
- City commitment to officially take over maintenance of Yuma County Water Users land for public parking and eventually invest for beatification

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action.

Supporting information not attached to the Agenda Item Review Form:

No attachments.

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: N/A

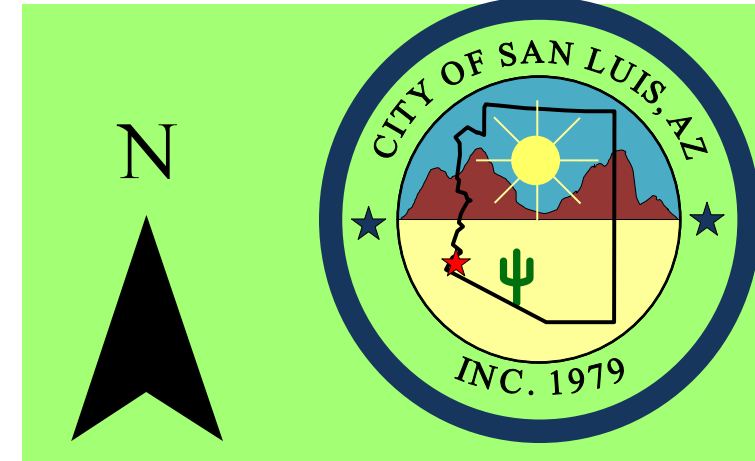
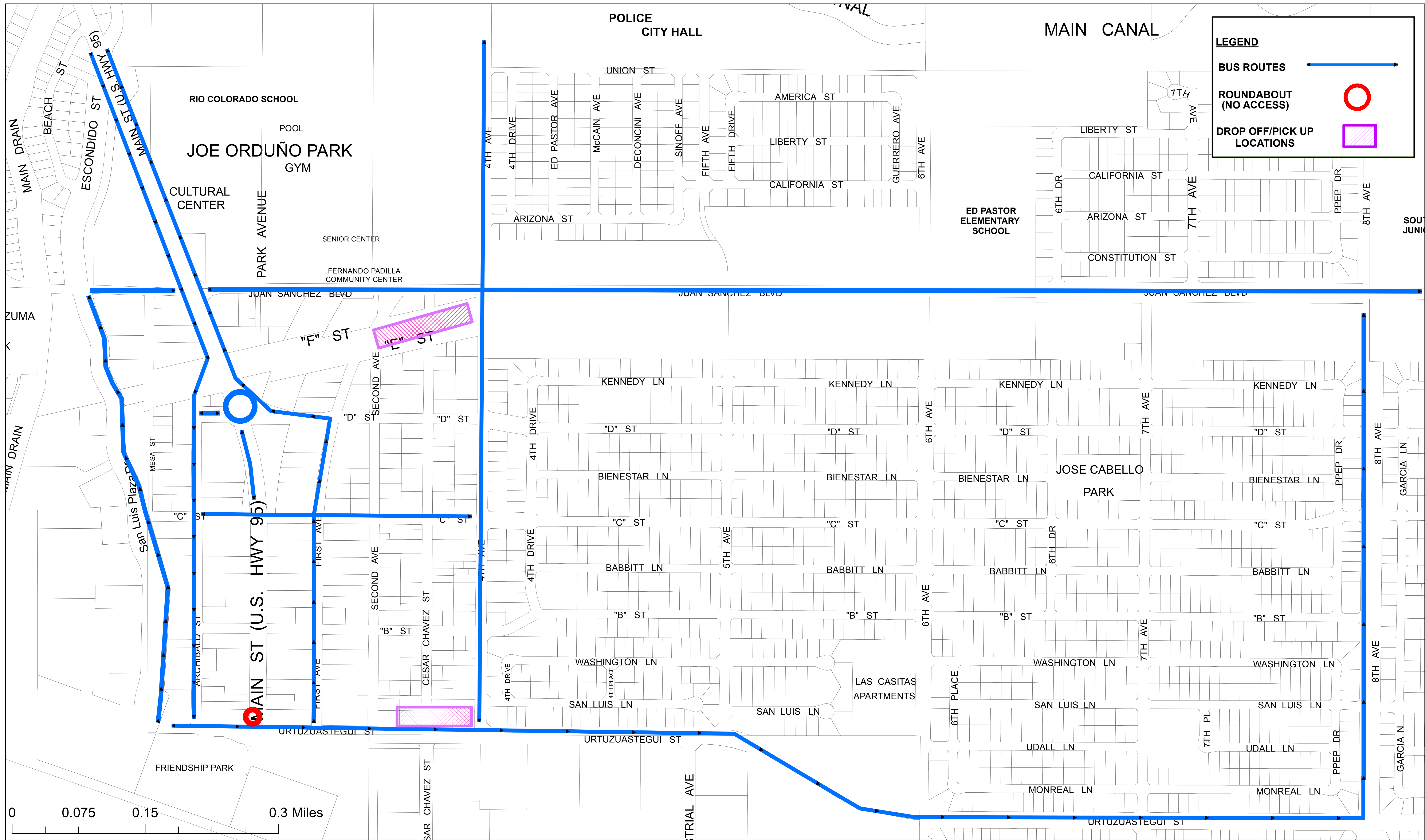
CITY/STATE/FEDERAL FUNDS: 0

TOTAL: 0

BUDGETED: 0
AVAILABLE TO TRANSFER: 0
ACCOUNT #/REMAINING BALANCE: 0
FISCAL IMPACT STATEMENT:
N/A

Attachments

AG BUS ROUTE 10/21/2015



PROPOSED AG BUS ROUTES

Prepared by:
 City of San Luis GIS Division
GISUSER@Cityofsanluis.org



AGENDA ITEM REVIEW FORM

City Council Work Session

3. D.

Meeting Date: 10/21/2015

Department Head: Eulogio Vera, Public Works Director, Public Works Department

Submitted By: Manuel Rojas, Assistant Public Works Director, Public Works Department

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding the Right-of-Way Improvements on Urtuzuastegui Street from 10th Ave to 9th Ave, a 1,300 feet section on the North side of Urtuzuastegui Street. **(Manuel Rojas, Assistant Public Works Director)**

SUMMARY:

For the past year, staff has been working with the Parks Department on different alternatives to improve the City's right-of-way, particularly on Urtuzaustegui Street. Staff is looking for direction on improvements from Council. The initial plan is to remove the current mesquite trees and add landscaping, benches and an exercise/stretching station. Urtuzuastegui Street is highly used by the community as an exercise corridor. Cost estimates will be obtained once Council directs staff on their vision of the area.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action.

Supporting information not attached to the Agenda Item Review Form:

Supporting information is attached to this Agenda Item Review Form.

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: N/A

CITY/STATE/FEDERAL FUNDS: N/A

TOTAL: N/A

BUDGETED: N/A

AVAILABLE TO TRANSFER: N/A

ACCOUNT #/REMAINING BALANCE: N/A

FISCAL IMPACT STATEMENT:

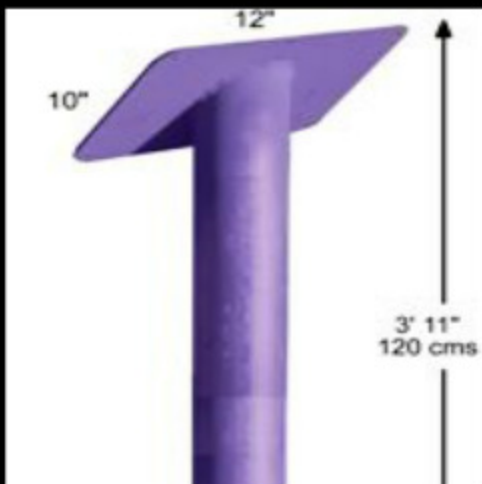
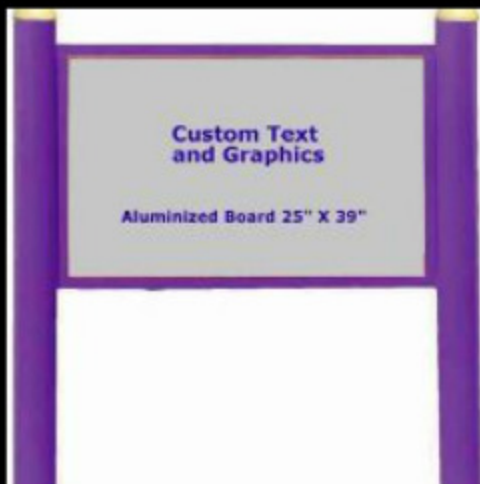
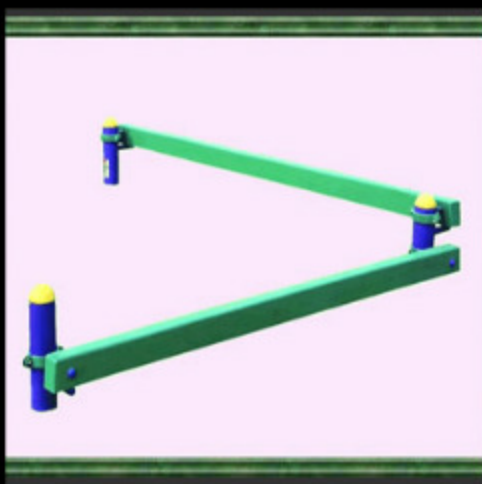
The concept landscaping project has no dollar amount set, we are looking for Council direction,. The balance in the Maintenance/Other account #200-210-70025 \$106,385.15.

Attachments

D St. Parking Lot
Excercise Equipment



Equipment & Signs





AGENDA ITEM REVIEW FORM

City Council Work Session

3. E.

Meeting Date: 10/21/2015

Submitted By: Sonia Cornelio, City Clerk, Office of the City Clerk

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Update on any and all matters regarding the side-walk project on 1st Avenue. **(Vice-Mayor Matias Rosales)**

SUMMARY:

Vice-Mayor Matias Rosales asked that this item be placed on the Agenda for the Work Session for October 21, 2015.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action to be taken.

Supporting information not attached to the Agenda Item Review Form:

N/A

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: NO

CITY/STATE/FEDERAL FUNDS: \$0

TOTAL: \$0

BUDGETED: \$0

AVAILABLE TO TRANSFER: \$0

ACCOUNT #/REMAINING BALANCE: N/A

FISCAL IMPACT STATEMENT:

NONE



AGENDA ITEM REVIEW FORM

City Council Work Session

3. F.

Meeting Date: 10/21/2015

Submitted By: Sonia Cornelio, City Clerk, Office of the City Clerk

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Discussion on any and all matters regarding the possible beautification and maintenance of Urtuzuastegui Street. **(Vice-Mayor Matias Rosales)**

SUMMARY:

Vice-Mayor Matias Rosales requested that this item be placed on the Agenda for the Work Session for October 21, 2015.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action to be taken.

Supporting information not attached to the Agenda Item Review Form:

N/A

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: NO

CITY/STATE/FEDERAL FUNDS: \$0

TOTAL: \$0

BUDGETED: \$0

AVAILABLE TO TRANSFER: \$0

ACCOUNT #/REMAINING BALANCE: N/A

FISCAL IMPACT STATEMENT:

NONE



AGENDA ITEM REVIEW FORM

City Council Work Session

3. G.

Meeting Date: 10/21/2015

Submitted By: Sonia Cornelio, City Clerk, Office of the City Clerk

Action Requested: Discussion Item - No Action to be Taken

ITEM:

Update on any and all matters regarding a working plan to update the City of San Luis Building Codes to current national codes. **(Vice Mayor Matias Rosales)**

SUMMARY:

Vice Mayor Matias Rosales requested that this item be placed on the Work Session for October 21, 2015. The City of San Luis currently has adopted the year 2003 editions of the International Building Codes and the latest editions are the year 2015.

RECOMMENDATION / SUGGESTED MOTION:

Discussion item only, no action to be taken.

Supporting information not attached to the Agenda Item Review Form:

N/A

Document to be Recorded?: No

N/A

Fiscal Impact

IS THERE FISCAL IMPACT ASSOCIATED WITH THIS ITEM: NO

CITY/STATE/FEDERAL FUNDS: N/A

TOTAL: N/A

BUDGETED: N/A

AVAILABLE TO TRANSFER: N/A

ACCOUNT #/REMAINING BALANCE: N/A

FISCAL IMPACT STATEMENT:

There is no fiscal impact on this item.
