

Draft Technical Memorandum #8 – Murphy
Road / Powers Road Improvement Concepts

Appendix

Appendix A – Detailed Cost Estimate

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Appendix A – Detailed Cost Estimate

Powers Road Tight Diamond Overcrossing

| | | | | | |
|--------------------------------|--------------|---------------|-----------------|---------------------|--------------------|
| | On Ramp (LF) | Off Ramp (LF) | Ramp Width (LF) | Grading Length (LF) | Roadway Width (LF) |
| Compressed Diamond Interchange | 1872.9234 | 2188.5703 | 26 | 892.4984 | 63 |

| Compressed Diamond Interchange | | | |
|-----------------------------------|--------------|-----------|--------------|
| | Cost/Unit | Qty | Costs |
| Clear and Grub (Acre) | \$25,000.00 | 2.42 | \$60,605.39 |
| Pavement (SF) | \$28.00 | 105598.84 | \$2,956,767 |
| Traffic Barrier (LF) | \$160.00 | 1785.00 | \$285,599 |
| Monolithic Curb and Sidewalk (SF) | \$20.00 | 10709.98 | \$214,200 |
| Intersections (EA) | \$325,000.00 | 2 | \$650,000.00 |
| Retaining Wall (SF) | \$30.00 | 17640.00 | \$529,200.00 |
| Noise Wall (SF) | \$34.00 | 16500 | \$561,000.00 |
| | | Sum = | \$5,257,372 |
| Earthwork | 30% | | \$1,577,212 |
| Drainage | 5% | | \$262,869 |
| Erosion Control | 1.5% | | \$78,861 |
| Signs | 2% | | \$105,147 |
| Pavement Marking | 2% | | \$105,147 |
| Traffic Control | 25% | | \$1,314,343 |
| Utility | 2% | | \$105,147 |
| | | Sum = | \$8,806,098 |

| Bridges | | |
|--------------------|--|----------|
| Bridge Cost per SF | | \$240.00 |
| Bridge Length | | 160 LF |
| Bridge Width | | 66.5 LF |

| New Bridge | | | |
|-------------------|--------------|----------------|---------------------|
| | Cost/Unit | Qty | Costs |
| Bridge (SF) | \$240.00 | 10640.00 | \$2,553,600 |
| Ramp Modification | \$500,000.00 | 2 | \$1,000,000 |
| User-Defined Item | | | |
| User-Defined Item | | | |
| User-Defined Item | | | |
| User-Defined Item | | | |
| User-Defined Item | | | |
| | | Sum = | \$3,553,600 |
| Earthwork | 30% | | \$1,066,080 |
| Drainage | 5% | | \$177,680 |
| Erosion Control | 1% | | \$35,536 |
| Signs | 1% | | \$35,536 |
| Pavement Marking | 1% | | \$35,536 |
| Traffic Control | 12% | | \$426,432 |
| Utility | 1% | | \$35,536 |
| | | Sum = | \$5,365,936 |
| | | Subtotal = | \$14,172,030 |
| Mobilization | 10% | | \$1,417,203 |
| Contingency | 40% | | \$6,235,693.20 |
| | | Total = | \$21,825,000 |

| Powers Overcrossing | | | | New Structure Length (LF) | Roadway Width (LF) |
|------------------------------|--------------|----------|--------------|---------------------------|--------------------|
| | Cost/Unit | Qty | Costs | 892.4984 | 63 |
| Clear and Grub (Acre) | \$25,000.00 | 1.29 | \$32,270.09 | | |
| Pavement (SF) | \$28.00 | 56227.40 | \$1,574,367 | | |
| Traffic Barrier (LF) | \$160.00 | 1785.00 | \$285,599 | | |
| Monolithic Curb and Sidewalk | \$20.00 | 10709.98 | \$214,200 | | |
| Intersections (EA) | \$325,000.00 | 2 | \$650,000.00 | | |
| | | Sum = | \$2,756,436 | | |
| Earthwork | 30% | | \$826,931 | | |
| Drainage | 5% | | \$137,822 | | |
| Erosion Control | 1.5% | | \$41,347 | | |
| Signs | 2% | | \$55,129 | | |
| Pavement Marking | 2% | | \$55,129 | | |
| Traffic Control | 25% | | \$689,109 | | |
| Utility | 2% | | \$55,129 | | |
| | | Sum = | \$4,617,031 | | |

| Powers Interchange Ramps | | | | Combined Ramp Length (LF) | Ramp Width (LF) |
|--------------------------|--------------|-----------|--------------|---------------------------|-----------------|
| | Cost/Unit | Qty | Costs | 4061.4937 | 26 |
| Clear and Grub (Acre) | \$25,000.00 | 2.42 | \$60,605.39 | | |
| Pavement (SF) | \$28.00 | 105598.84 | \$2,956,767 | | |
| Traffic Barrier (LF) | \$160.00 | 8122.99 | \$1,299,678 | | |
| Intersections (EA) | \$325,000.00 | 2 | \$650,000.00 | | |
| Retaining Wall (SF) | \$30.00 | 17640.00 | \$529,200.00 | | |
| Noise Wall (SF) | \$34.00 | 16500 | \$561,000.00 | | |
| | | Sum = | \$6,057,251 | | |
| Earthwork | 30% | | \$826,931 | | |
| Drainage | 5% | | \$137,822 | | |
| Erosion Control | 1.5% | | \$41,347 | | |
| Signs | 2% | | \$55,129 | | |
| Pavement Marking | 2% | | \$55,129 | | |
| Traffic Control | 25% | | \$689,109 | | |
| Utility | 2% | | \$55,129 | | |
| | | Sum = | \$7,917,845 | | |

| | | | |
|-------------------|-----|------------|----------------|
| Overcrossing Cost | | Subtotal = | \$4,617,031 |
| | 10% | | \$461,703 |
| | 40% | | \$2,031,493.60 |
| | | | \$7,110,000 |

Murphy Road Half-Interchange Improvements and Frontage Road

| | | | | | |
|------------------|--------------|---------------|-----------------|---------------------|--------------------|
| | On Ramp (LF) | Off Ramp (LF) | Ramp Width (LF) | Grading Length (LF) | Roadway Width (LF) |
| Half Interchange | 1306.3885 | 930.5938 | 26 | 478.6202 | 63 |

| Half Interchange | | | |
|-----------------------------------|--------------|-----------|--------------|
| | Cost/Unit | Qty | Costs |
| Clear and Grub (Acre) | \$25,000.00 | 1.34 | \$33,380.13 |
| Pavement (SF) | \$28.00 | 58161.54 | \$1,628,523 |
| Traffic Barrier (LF) | \$160.00 | 957.24 | \$153,158 |
| Monolithic Curb and Sidewalk (SF) | \$20.00 | 5743.4424 | \$114,869 |
| Intersections (EA) | \$325,000.00 | 2 | \$650,000 |
| Retaining Wall (SF) | \$30.00 | 7560 | \$226,800 |
| Guardrail (LF) | \$26.00 | 4473.96 | \$116,323.08 |
| Guardrail Terminals (EA) | \$3,200.00 | 4 | \$12,800.00 |
| Sum = | | | \$2,935,854 |

| | | | |
|------------------|------|-----------|-------------|
| Earthwork | 30% | \$880,756 | |
| Drainage | 5% | \$146,793 | |
| Erosion Control | 1.5% | \$44,038 | |
| Signs | 2% | \$58,717 | |
| Pavement Marking | 2% | \$58,717 | |
| Traffic Control | 25% | \$733,963 | |
| Utility | 2% | \$58,717 | |
| Sum = | | | \$4,917,559 |

| | | |
|----------------------|-----------|-----------------|
| | Road (LF) | Road Width (LF) |
| Frontage Road System | 3442.2856 | 77 |

| Frontage Road System | | | |
|-----------------------|--------------|------------|--------------|
| | Cost/Unit | Qty | Costs |
| Clear and Grub (Acre) | \$25,000.00 | 6.08 | \$152,121.21 |
| Pavement (SF) | \$28.00 | 265055.99 | \$7,421,568 |
| Curb & Gutter (LF) | \$20.00 | 6884.5712 | \$137,691 |
| Sidewalk (SF) | \$8.00 | 41307.4272 | \$330,459 |
| Intersections (EA) | \$300,000.00 | 3 | \$900,000 |
| Sum = | | | \$8,941,840 |

| | | | |
|------------------|------|----------------|--------------|
| Earthwork | 30% | \$2,682,551.94 | |
| Drainage | 5% | \$447,091.99 | |
| Erosion Control | 1.5% | \$134,127.60 | |
| Signs | 2% | \$178,836.80 | |
| Pavement Marking | 2% | \$178,836.80 | |
| Traffic Control | 25% | \$2,235,459.95 | |
| Utility | 2% | \$178,836.80 | |
| Sum = | | | \$14,977,582 |

| Bridge Removal Cost | | | |
|---------------------|-----------|--------|----------|
| | Cost/Unit | Qty | Costs |
| Removal Length (LF) | 142.5 | | 142.5 |
| Removal Width (LF) | 4 | | 4 |
| Bridge Removal (SF) | \$60.00 | 570.00 | \$34,200 |
| Sum = | | | \$34,200 |

| New Bridge Cost | | | |
|-----------------|-----------|---------|-------------|
| | Cost/Unit | Qty | Costs |
| Length (LF) | 142.5 | | 142.5 |
| Width (LF) | 38.875 | | 38.875 |
| Bridge (SF) | \$326.00 | 5539.69 | \$1,805,938 |

| | | | |
|------------------|----|----------|-------------|
| Earthwork | 0% | \$0 | |
| Drainage | 0% | \$0 | |
| Erosion Control | 0% | \$0 | |
| Signs | 0% | \$0 | |
| Pavement Marking | 0% | \$0 | |
| Traffic Control | 0% | \$0 | |
| Utility | 3% | \$54,178 | |
| Sum = | | | \$1,860,116 |

| | | |
|-------------------|-----|--------------|
| Subtotal = | | \$21,789,000 |
| Mobilization | 10% | \$2,178,900 |
| Contingency | 40% | \$9,587,160 |
| Total = | | \$33,555,000 |

| Interchange without Frontage Roads | | |
|------------------------------------|-----|--------------|
| | | |
| Subtotal = | | \$6,811,871 |
| Mobilization | 10% | \$681,187 |
| Contingency | 40% | \$2,997,223 |
| Total = | | \$10,490,000 |

| Frontage Road Loop (West of Murphy) | | | |
|-------------------------------------|--------------|----------------|-------------|
| | Cost/Unit | Qty | Costs |
| Clear and Grub (Acre) | \$25,000.00 | 2.38 | \$59,442.57 |
| Pavement (SF) | \$28.00 | 103572.74 | \$2,900,037 |
| Curb & Gutter (LF) | \$20.00 | 2690.20 | \$53,804 |
| Sidewalk (SF) | \$8.00 | 16141.21 | \$129,130 |
| Intersections (EA) | \$300,000.00 | 2 | \$600,000 |
| Sum = | | | \$3,742,413 |
| Earthwork | 30% | \$1,122,723.88 | |
| Drainage | 5% | \$187,120.65 | |
| Erosion Control | 1.5% | \$56,136.19 | |
| Signs | 2% | \$74,848.26 | |
| Pavement Marking | 2% | \$74,848.26 | |
| Traffic Control | 25% | \$935,603.23 | |
| Utility | 2% | \$74,848.26 | |
| Sum = | | | \$6,268,542 |
| Subtotal = | | | \$9,654,000 |
| Mobilization | 10% | \$626,854 | |
| Contingency | 40% | \$2,758,158 | |
| Total = | | \$13,039,012 | |

| North Frontage Road | | |
|---------------------|-----|--------------|
| | | |
| | | \$8,709,040 |
| Mobilization | 10% | \$870,904 |
| Contingency | 40% | \$3,831,978 |
| Total = | | \$13,412,000 |

| Unit | Unit Cost | Unit | Unit Cost | Source | | |
|------------------|--------------|------|--------------|--------|----------|--------------------------|
| Roadway | \$/lane-mile | \$ | 1,820,000.00 | SF | \$ 28.72 | WSDOT PLCE |
| Bridge | \$ | | 180.00 | | | ODOT Cost Data Book 2016 |
| Retaining Wall | \$ | | 125.00 | | | WSDOT PLCE |
| Conc. Median | \$ | | 35.00 | | | WSDOT PLCE |
| Sidewalk | \$ | | 8.00 | | | SSTC Project from Brian |
| Curb & Gutter | \$ | | 20.00 | | | SSTC Project from Brian |
| Traffic Signal | \$ | | 250,000.00 | | | WSDOT PLCE |
| Mill and Overlay | \$ | | 53.50 | | | GDOT |
| Noise Wall | \$ | | 455.00 | | | WSDOT PLCE |
| Bridge Removal | \$ | | 125.00 | | | WSDOT PLCE |

| Deck Area Total Cost Summary Fiscal Year 2016 | | | | | |
|--|------------------------|----------------------|----------------------|----------------------|--|
| Structure Type | Total Area Square Feet | Total Bid Amount | Cost per Square Feet | Number of Structures | |
| P.S. Slabs - 26 inch | 8,218.6 | \$ 996,959 | \$ 121.31 | 2 | |
| P.S. Slabs - 30 inch | 4,014.0 | \$ 809,823 | \$ 201.75 | 2 | |
| Precast Prest. R.C. Box Girder - 33 inch | 13,198.5 | \$ 4,894,629 | \$ 370.85 | 1 | |
| Precast Prest. R.C. Deck Girder - BI 51 | 6,244.8 | \$ 1,808,009 | \$ 289.52 | 2 | |
| Precast Prest. R.C. Deck Girder - BI 63 | 13,921.3 | \$ 2,334,928 | \$ 167.70 | 1 | |
| Precast Prest. R.C. Deck Girder - BI 78 | 8,477.3 | \$ 1,303,969 | \$ 153.82 | 1 | |
| Precast Prest. R.C. Deck Girder - BY 33 inch | 5,833.3 | \$ 945,306 | \$ 162.05 | 1 | |
| Precast Prest. R.C. Deck Girder - BT 36 & 60 inches | 11,136.1 | \$ 1,277,424 | \$ 114.71 | 1 | |
| Precast Prest. R.C. Deck Girder - BT 60 & 72 inches | 20,383.0 | \$ 2,524,700 | \$ 123.86 | 1 | |
| Accelerated Bridge Construction - P.S. Slab 26 inch | 4,505.9 | \$ 731,976 | \$ 162.45 | 1 | |
| Steel Plate Girders | 5,489.4 | \$ 749,984 | \$ 136.62 | 1 | |
| Total | 101,422.2 | \$ 18,377,304 | \$ 181.20 | 14 | |

Manual for Planning Level Cost Estimation (PFCE) Tool

| Interchange Type | In Terms of 2012\$ Values | | | |
|---|---------------------------|------------|------------|-------------|
| | Puget Sound | Vancouver | Spokane | Other Areas |
| Heavy modification | \$5.09 M | \$1.80 M | \$3.92 M | \$2.48 M |
| Diamond at urban/minor crossroad | \$24.49 M | \$19.84 M | \$21.20 M | \$14.31 M |
| Diamond at urban/arterial | \$36.15 M | \$26.87 M | \$27.79 M | \$18.48 M |
| Diamond at urban/limited access | \$43.27 M | \$32.82 M | \$34.20 M | \$23.29 M |
| Half-diamond | \$17.26 M | \$13.95 M | \$14.17 M | \$10.22 M |
| HOV direct access interchange - one directional | \$47.09 M | \$33.49 M | \$34.01 M | \$29.67 M |
| HOV direct access interchange - two directional | \$94.53 M | \$69.34 M | \$61.59 M | \$54.06 M |
| HOV direct access interchange - international with freeway on/off for median widening | \$94.70 M | \$67.52 M | \$69.23 M | \$56.89 M |
| HOV direct access interchange - with bypass ramp to HOV facility | \$44.20 M | \$30.04 M | \$30.47 M | \$26.57 M |
| Single point urban interchange at major arterial crossroad | \$56.76 M | \$41.17 M | \$42.96 M | \$34.50 M |
| Single point urban interchange at major arterial crossroad | \$63.44 M | \$45.89 M | \$47.00 M | \$36.42 M |
| Partial overleaf with 1 or 2 loop ramps and small footprint | \$43.93 M | \$28.16 M | \$27.23 M | \$17.04 M |
| Partial overleaf with 3 loop ramps and large footprint | \$50.60 M | \$32.69 M | \$31.96 M | \$19.84 M |
| Full overleaf with small footprint | \$51.82 M | \$42.73 M | \$44.99 M | \$27.43 M |
| Full overleaf with large footprint | \$63.87 M | \$48.89 M | \$50.58 M | \$31.06 M |
| Partial developed with 1 flyover | \$87.82 M | \$64.14 M | \$62.10 M | \$38.32 M |
| Partial developed with 2 flyover | \$158.22 M | \$99.29 M | \$99.55 M | \$51.10 M |
| Partial developed with 3 flyover | \$114.51 M | \$85.70 M | \$86.73 M | \$59.17 M |
| Full directional with 4 flyover ramp | \$195.27 M | \$135.38 M | \$135.37 M | \$104.85 M |
| Full directional with some HOV direct connections | \$248.86 M | \$168.07 M | \$167.46 M | \$135.08 M |
| Full directional for toll GP and HOV roadways | \$302.98 M | \$201.32 M | \$199.97 M | \$166.14 M |

*Does not include right of way, wetland mitigation, or I.T.S.

Exhibit 6: Base Cost* of Roadway Mainline Freeways and Limited Access Highways (2012\$)

| | Puget Sound (\$/lane-mile) | Vancouver (\$/lane-mile) | Spokane (\$/lane-mile) | Other Areas (\$/lane-mile) |
|-------------|----------------------------|--------------------------|------------------------|----------------------------|
| Rural | 2.69 M | 2.15 M | 2.16 M | 1.82 M |
| Suburban | 2.91 M | 2.15 M | 2.23 M | 1.82 M |
| Urban | 4.62 M | 3.19 M | 2.98 M | 1.82 M |
| Dense Urban | 7.38 M | 5.49 M | ----- | ----- |

| Arterials and Non-Limited Access Highways (2012\$) | | | | |
|--|----------------------------|--------------------------|------------------------|----------------------------|
| | Puget Sound (\$/lane-mile) | Vancouver (\$/lane-mile) | Spokane (\$/lane-mile) | Other Areas (\$/lane-mile) |
| Rural | 2.51 M | 1.80 M | 1.81 M | 1.82 M |
| Suburban | 2.73 M | 1.87 M | 1.95 M | 1.82 M |
| Urban | 4.58 M | 3.03 M | 2.81 M | 1.82 M |
| Dense Urban | 6.54 M | 5.04 M | ----- | ----- |

*Does not include interchanges, bridges, walls, wetland mitigation, right of way, or intelligent transportation systems.

APPENDIX B: DEFAULT UNIT PRICES

| Items | Unit | Unit Cost (2012\$) | | | |
|------------------------------------|--------------|--------------------|-----------|-----------|-------------|
| | | Rural | Suburban | Urban | Dense Urban |
| Grading | | | | | |
| Clear and grub | Acres | \$4,700 | \$4,700 | \$4,700 | \$4,700 |
| Building embankment | L/Slane-mile | \$9,000 | \$12,000 | \$63,000 | \$118,000 |
| Removal of structure | L/Slane-mile | \$47,000 | \$47,000 | \$94,000 | \$149,000 |
| Prevent erosion | SF | \$7.67 | \$9.98 | \$11.50 | \$12.78 |
| Roadside cleanup | L/Slane-mile | \$6,000 | \$6,000 | \$6,000 | \$12,000 |
| Roadway excavation | CY | \$8.73 | \$10.91 | \$12.50 | \$14.18 |
| Cut and backfill | CY | \$5.50 | \$5.19 | \$9.00 | \$20.00 |
| Drainage | | | | | |
| Remove drainage structures | Each | \$260 | \$300 | \$300 | \$520 |
| Conveyance 24" MCSP | LF | \$65 | \$65 | \$65 | \$65 |
| Catch basin type 2 - 48" | Each | \$2,300 | \$2,300 | \$2,300 | \$2,600 |
| Collection pipe 12" PCSP | LF | \$48 | \$48 | \$48 | \$51 |
| Large inlets | LF | \$1,900 | \$1,900 | \$1,900 | \$1,900 |
| Grch inspection | LF | \$18.84 | \$18.84 | \$18.84 | \$18.84 |
| Stormwater Treatment | | | | | |
| Detention pond | SF of Imp. | \$1.44 | \$1.44 | \$1.83 | \$1.76 |
| Water quality pond | SF of Imp. | \$0.61 | \$0.61 | \$0.85 | \$0.86 |
| Detention swale | SF of Imp. | \$10.10 | \$10.10 | \$10.45 | \$10.81 |
| Filteration treatment | SF of Imp. | \$0.86 | \$0.86 | \$0.86 | \$0.86 |
| Paving | | | | | |
| Asphalt concrete pavement | SF | \$4.75 | \$4.75 | \$5.25 | \$5.25 |
| Portland cement conc. pavement | SF | \$9.00 | \$9.00 | \$9.75 | \$9.48 |
| Roadside Development | | | | | |
| Fencing | LF | \$12 | \$12 | \$12 | \$12 |
| Soil stabilization and fertilizing | Acres | \$1,330 | \$2,000 | \$2,000 | \$2,670 |
| Roadside restoration | L/Slane-mile | \$148,000 | \$148,000 | \$177,000 | \$295,000 |
| Traffic Services and Safety | | | | | |
| Guardrail | LF | \$26 | \$26 | \$26 | \$26 |
| Guardrail terminals | Each | \$2,100 | \$2,100 | \$2,100 | \$2,100 |
| Concrete barrier | LF | \$35 | \$35 | \$35 | \$35 |
| Impact attenuator | Each | \$27,000 | \$27,000 | \$27,000 | \$27,000 |
| Signage | Each | \$180,000 | \$178,000 | \$178,000 | \$178,000 |
| Illumination | Each | \$9,000 | \$9,000 | \$9,000 | \$9,000 |
| Intelligent transportation system | L/Slane-mile | \$193,000 | \$193,000 | \$193,000 | \$193,000 |
| Signage | L/Slane-mile | \$12,000 | \$36,000 | \$36,000 | \$36,000 |
| Carrieway sign bridge | Each | \$60,000 | \$60,000 | \$60,000 | \$60,000 |
| Sign bridge | Each | \$150,000 | \$150,000 | \$200,000 | \$295,000 |
| Traffic markings | LF | \$0.29 | \$0.29 | \$0.29 | \$0.29 |
| Raised channelization | LF | \$24 | \$24 | \$24 | \$24 |
| Curb, gutter and sidewalk | LF | \$45 | \$45 | \$45 | \$45 |

Exhibit B-2: Default Unit Cost of Structures in Central Puget Sound Region

| Items | Unit | Unit Cost (2012\$) | | | |
|--------------------------------------|------|--------------------|----------|----------|-------------|
| | | Rural | Suburban | Urban | Dense Urban |
| Widening existing bridge | SF | \$355 | \$355 | \$355 | \$390 |
| Roadway bridge (open up to 140') | SF | \$175 | \$175 | \$175 | \$200 |
| Roadway bridge (open up to 200') | SF | \$200 | \$200 | \$200 | \$220 |
| Roadway bridge (open up to 400') | SF | \$355 | \$355 | \$355 | \$390 |
| Roadway bridge (open more than 400') | SF | \$355 | \$355 | \$355 | \$390 |
| Removal of existing bridge | SF | \$60 | \$60 | \$60 | \$70 |
| Flouting bridge | SF | \$870 | \$870 | \$870 | \$870 |
| Movable bridge | SF | \$1,800 | \$1,800 | \$1,800 | \$1,800 |
| Lid without ventilation | SF | \$175 | \$175 | \$175 | \$195 |
| Tunnel | LF | \$77,000 | \$77,000 | \$77,000 | \$77,000 |
| Raised bridge replacement | LF | \$12,000 | \$12,000 | \$12,000 | \$12,000 |
| Pedestrian bridge | SF | \$175 | \$175 | \$175 | \$175 |
| Retaining wall | SF | \$125 | \$125 | \$130 | \$130 |
| Noise wall | LF | \$455 | \$455 | \$455 | \$455 |

Appendix B – Murphy-Powers Evaluation Tables

| Goal | Evaluation Criteria (Level 2) | Evaluation Rating | | | | | | | | | |
|------|--|--|---|--|----|--|---|--|---|--|---|
| | | Murphy Interchange Project | | | | Frontage Road Projects | | | | | |
| | | Northbound Loop Ramp and Southbound Off-Ramp | | Tight Diamond | | North Frontage Road | | South Frontage Road | | West Loop Frontage Road | |
| 1 | Reduction in crash frequency (all modes) | Safety benefits negated by tight northbound loop ramp | 0 | Grade separation replaces China Hat and Pinebrook RIRO | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 |
| | Reduction in crash severity (all modes) | Safety benefits negated by tight northbound loop ramp | 0 | Grade separation replaces China Hat and Pinebrook RIRO | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 | Minor benefits related to local circulation improvements and corresponding congestion reduction at key intersections | 2 |
| 2 | Travel Time Reliability measures on the Bend Parkway (planning time index) | No change | 0 | No change | 0 | No change | 0 | No change | 0 | No change | 0 |
| | Percent through traffic on congested segments (modeled demand/capacity ratio > 1.0) of the Bend Parkway | No change | 0 | No change | 0 | No change | 0 | No change | 0 | No change | 0 |
| | Degree to which the alternative enhances travel for multiple modes (qualitative assessment) | No change | 0 | Provides complete connection to an additional Low Stress crossing of US 97 | 2 | Provides opportunity for N-S low stress active transportation facility | 2 | No change | 0 | No change | 0 |
| 3 | Ability to meet ODOT v/c targets | Ramp terminal free flow, so meet ODOT standard. However, 3rd/Murphy degrades | 1 | Meets ODOT v/c ratios at ramp terminals when combined with Powers Interchange | 2 | No change | 0 | No change | 0 | Allows Murphy Diamond ramp terminals to function within ODOT mobility targets | 2 |
| | Ability to meet Bend mobility standards (v/c ratios and LOS) | Improves multiple local intersections | 1 | Improves multiple local intersections | 1 | Benefits to Brookwood/Murphy, Powers/Parrell, Powers Brookwood | 2 | Benefits to Brookwood/Murphy, Murphy Parrell | 2 | Benefits to 3rd/Murphy | 1 |
| 4 | Travel Time Reliability measures (planning time index) for specific routes during PM peak hour | No change | 0 | No change | 0 | No change | 0 | No change | 0 | No change | 0 |
| | Peak Hour VMT by street classification | Relieves Parrell, Brookwood (benefit from south frontage road) | 2 | Increased traffic on Brookwood and Parrell due to absence of south frontage road | -1 | Shifts traffic off Brookwood | 1 | Shifts Traffic off Parrell | 1 | No change | 0 |
| 5 | Number of bike and pedestrian crossing locations on the Bend Parkway with low Level of Traffic Stress (LTS 2 or lower) | NA | 0 | By connecting the overcrossing with West Loop Frontage Road and 3rd Street, a new Low stress crossing is completed | 2 | No change | 0 | No change | 0 | No change | 0 |
| | Miles of north-south bike and pedestrian facilities with low Level of Traffic Stress within 0.25 miles of the Bend Parkway | NA | 0 | NA | 0 | Provides opportunity for N-S low stress active transportation facility | 2 | No change | 0 | No change | 0 |
| | Does the alternative allow for transportation demand management strategies? | NA | 0 | NA | 0 | No change | 0 | No change | 0 | No change | 0 |
| | Total PM peak hour vehicle delay (vehicle hours) | NA | 0 | Improves Murphy/3rd Operations | 1 | Benefits to Brookwood/Murphy, Powers/Parrell, Powers Brookwood | 1 | Benefits to Brookwood/Murphy, Murphy Parrell | 1 | Benefits to 3rd/Murphy | 1 |

| | | | | | | | | | | | |
|------------------|---|--|----|---|----|--------------------------------------|----|----------------------------------|----|----------------------------------|----|
| 6 | Total PM peak hour vehicle miles traveled (regional measure) | Better connectivity due to south frontage road improves VMT | 1 | No change | 0 | Improves local connectivity | 1 | Improves local connectivity | 1 | Improves local connectivity | 1 |
| | Approximate degree of right of way impacts (order of magnitude costs) | ROW impacts to build properties from the north loop ramp | -1 | Some local ROW impact | 0 | Potential built out property impacts | -2 | Significant vacant land impacts | -1 | Significant vacant land impacts | -1 |
| 7 | Total cost | \$9,900,000, does not include South Frontage Road Cost | 1 | \$10,490,000, does not include West Loop Frontage Road Cost | 0 | \$13,412,000 | 0 | \$10,600,000 | 0 | \$9,654,000 | 1 |
| | Reduction in economic cost of delay and crashes | improvements to delay | 1 | improvements to delay and safety | 2 | improvements to delay and safety | 1 | improvements to delay and safety | 1 | improvements to delay and safety | 1 |
| | Does alternative leverage existing planned projects and programs? | Yes, connects with multiple TSP projects | 2 | Yes, does not preclude other TSP projects | 2 | Links with multiple TSP projects | 2 | Links with multiple TSP projects | 2 | Links with multiple TSP projects | 2 |
| 8 | Can the alternative be separated into reasonably fundable and constructible phases? | Partially. Northbound loop ramp could be constructed separately, but the southbound off-ramp requires the southbound frontage road to function | 0 | Yes, bridge could be widened first, ramps second, West Loop Frontage connection to Murphy third | 1 | Yes | 1 | Yes | 1 | Yes | 1 |
| | Does the alternative have local agency support? | Included in TSP | 1 | Study encouraged by City and MPO | 1 | Yes | 1 | Yes | 1 | Yes | 1 |
| Evaluation Total | | | 9 | 17 | 16 | 13 | 14 | | | | |

| Goal | Evaluation Criteria (Level 2) | South Study Area Projects Evaluation Rating | | | |
|-------------------------|--|--|-----------|--|-----------|
| | | Powers Rd. Projects | | | |
| | | Overcrossing | | Interchange | |
| 1 | Reduction in crash frequency (all modes) | -100% | 4 | -34% (CMF avg) | 2 |
| | Reduction in crash severity (all modes) | -100% | 4 | -28% (CMF avg) | 2 |
| 2 | Travel Time Reliability measures on the Bend Parkway (planning time index) | Removes congestion bottleneck at Powers Road, Improving TTR by -1.04 | 2 | Removes congestion bottleneck at Powers Road, Improving TTR by -1.04 | 2 |
| | Percent through traffic on congested segments (modeled demand/capacity ratio > 1.0) of the Bend Parkway | Reduces congestion on over capacity segment by removing at-grade intersection | 1 | Reduces congestion on over capacity segment by removing at-grade intersection | 1 |
| | Degree to which the alternative enhances travel for multiple modes (qualitative assessment) | Improves crossing for pedestrians and bicyclists; improves congestion for motor vehicles | 1 | Improves crossing for pedestrians and bicyclists; improves congestion for motor vehicles | 1 |
| 3 | Ability to meet ODOT v/c targets | Worsens v/c at Reed Market interchange and Murphy Road Interchange | -1 | V/C ratio changes from 1.24/0.09 to 0.84/0.57 | 2 |
| | Ability to meet Bend mobility standards (v/c ratios and LOS) | Traffic will be diverted to local system because they can no longer enter the Parkway at this location | -2 | No change | 0 |
| 4 | Travel Time Reliability measures (planning time index) for specific routes during PM peak hour | Traffic diverted to 3rd St, which was identified as an unreliable route in the Bend TSP analysis | -1 | Draws traffic from Reed Market Rd. corridor with improved connectivity to improve reliability (Reed Market Rd. identified as an unreliable corridor in the TSP analysis) | 1 |
| | Peak Hour VMT by street classification | Traffic diverted to local system, increasing VMT on local system | -1 | NA | 0 |
| 5 | Number of bike and pedestrian crossing locations on the Bend Parkway with low Level of Traffic Stress (LTS 2 or lower) | Bikes/peds are no longer required to cross the busy ramp terminals | 2 | Bike LTS/Ped LTS Improvement - 1/1 | 1 |
| | Miles of north-south bike and pedestrian facilities with low Level of Traffic Stress within 0.25 miles of the Bend Parkway | NA | 0 | NA | 0 |
| | Does the alternative allow for transportation demand management strategies? | NA | 0 | NA | 0 |
| 6 | Total PM peak hour vehicle delay (vehicle hours) | NA | 0 | F/F to C/B | 2 |
| | Total PM peak hour vehicle miles traveled (regional measure) | Traffic diverted to local system, increasing VMT | -1 | NA | 0 |
| | Approximate degree of right of way impacts (order of magnitude costs) | Minimal ROW impacts | 0 | Moderate ROW impacts | -1 |
| 7 | Total cost | \$7,110,000 | 1 | \$21,825,000 | -2 |
| | Reduction in economic cost of delay and crashes | Significant reduction in cost of crashes | 1 | Significant reduction in cost of delay and crashes | 2 |
| | Does alternative leverage existing planned projects and programs? | None | 0 | None | 0 |
| 8 | Can the alternative be separated into reasonably fundable and constructible phases? | One phase, moderate cost | 0 | Could be phased with an overcrossing, but only if Murphy interchange is constructed first | -1 |
| | Does the alternative have local agency support? | Not on City project lists | 0 | Yes, on TSP update 2040 project list (pending analysis from the Parkway Study) | 1 |
| Evaluation Total | | | 10 | | 13 |

Appendix C – Powers – Murphy HCM Results

2040 30HV Powers Interchange and Murphy Diamond HCM

2040 30HV Powers Interchange and Murphy Loops + Frontage HCM

2040 30HV Powers Interchange and Existing Murphy HCM

2040 30HV Powers Overcrossing and Murphy Diamond HCM

2040 30HV Powers Overcrossing and Murphy Loops + Frontage HCM

2040 30HV Powers Interchange and Murphy Diamond HCM

HCM Signalized Intersection Capacity Analysis
 22: US 97 SB Ramp & Powers Rd

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | |
|-----------------------------------|------|-------|-------|-------|-------|------|------|------|------|------|------|---------------------------|----------------------|---|
| Lane Configurations | | ↔ | | ↔ | ↑ | | | | | | ↔ | ↔ | | |
| Traffic Volume (vph) | 0 | 742 | 78 | 46 | 514 | 0 | 0 | 0 | 0 | 462 | 0 | 410 | | |
| Future Volume (vph) | 0 | 742 | 78 | 46 | 514 | 0 | 0 | 0 | 0 | 462 | 0 | 410 | | |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | | |
| Total Lost time (s) | | 4.0 | | 4.0 | 4.0 | | | | | | 4.0 | 4.0 | | |
| Lane Util. Factor | | 1.00 | | 1.00 | 1.00 | | | | | | 1.00 | 1.00 | | |
| Frt | | 0.99 | | 1.00 | 1.00 | | | | | | 1.00 | 0.85 | | |
| Flt Protected | | 1.00 | | 0.95 | 1.00 | | | | | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | | 1723 | | 1662 | 1750 | | | | | | 1662 | 1488 | | |
| Flt Permitted | | 1.00 | | 0.09 | 1.00 | | | | | | 0.95 | 1.00 | | |
| Satd. Flow (perm) | | 1723 | | 155 | 1750 | | | | | | 1662 | 1488 | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | |
| Adj. Flow (vph) | 0 | 781 | 82 | 48 | 541 | 0 | 0 | 0 | 0 | 486 | 0 | 432 | | |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 227 | | |
| Lane Group Flow (vph) | 0 | 859 | 0 | 48 | 541 | 0 | 0 | 0 | 0 | 0 | 486 | 205 | | |
| Heavy Vehicles (%) | 0% | 0% | 3% | 0% | 0% | 0% | 33% | 0% | 1% | 0% | 0% | 0% | | |
| Turn Type | | NA | | pm+pt | NA | | | | | Perm | NA | Perm | | |
| Protected Phases | | 8 | | 7 | 4 | | | | | | 2 | | | |
| Permitted Phases | | | | 4 | | | | | | 2 | | 2 | | |
| Actuated Green, G (s) | | 52.6 | | 60.8 | 60.8 | | | | | | 29.2 | 29.2 | | |
| Effective Green, g (s) | | 53.6 | | 61.8 | 61.8 | | | | | | 30.2 | 30.2 | | |
| Actuated g/C Ratio | | 0.54 | | 0.62 | 0.62 | | | | | | 0.30 | 0.30 | | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | | 5.0 | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | | | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | | 923 | | 159 | 1081 | | | | | | 501 | 449 | | |
| v/s Ratio Prot | | c0.50 | | 0.01 | c0.31 | | | | | | | | | |
| v/s Ratio Perm | | | | 0.17 | | | | | | | 0.29 | 0.14 | | |
| v/c Ratio | | 0.93 | | 0.30 | 0.50 | | | | | | 0.97 | 0.46 | | |
| Uniform Delay, d1 | | 21.5 | | 17.4 | 10.6 | | | | | | 34.5 | 28.3 | | |
| Progression Factor | | 1.00 | | 1.32 | 0.88 | | | | | | 1.00 | 1.00 | | |
| Incremental Delay, d2 | | 17.0 | | 0.9 | 1.4 | | | | | | 32.5 | 0.7 | | |
| Delay (s) | | 38.5 | | 23.8 | 10.7 | | | | | | 66.9 | 29.0 | | |
| Level of Service | | D | | C | B | | | | | | E | C | | |
| Approach Delay (s) | | 38.5 | | | 11.8 | | | 0.0 | | | 49.1 | | | |
| Approach LOS | | D | | | B | | | A | | | D | | | |
| Intersection Summary | | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 35.9 | | | | | | | | | HCM 2000 Level of Service | D | |
| HCM 2000 Volume to Capacity ratio | | | 0.93 | | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | | | | | | 12.0 | | Sum of lost time (s) | |
| Intersection Capacity Utilization | | | 88.7% | | | | | | | | | | ICU Level of Service | E |
| Analysis Period (min) | | | 15 | | | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis

24: Powers Rd & US 97 NB Ramp

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|------|------|------|-------|------|------|------|------|------|
| Lane Configurations | ↖ | ↗ | | | ↖ | | ↖ | ↗ | | | | |
| Traffic Volume (vph) | 286 | 918 | 0 | 0 | 514 | 143 | 46 | 0 | 39 | 0 | 0 | 0 |
| Future Volume (vph) | 286 | 918 | 0 | 0 | 514 | 143 | 46 | 0 | 39 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | | 4.0 | 4.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | 0.97 | | 1.00 | 0.85 | | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (prot) | 1646 | 1733 | | | 1695 | | 1662 | 1488 | | | | |
| Flt Permitted | 0.29 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (perm) | 507 | 1733 | | | 1695 | | 1662 | 1488 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 301 | 966 | 0 | 0 | 541 | 151 | 48 | 0 | 41 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 38 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 301 | 966 | 0 | 0 | 685 | 0 | 48 | 3 | 0 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | | | |
| Protected Phases | 3 | 8 | | | 4 | | | 6 | | | | |
| Permitted Phases | 8 | | | | | | 6 | | | | | |
| Actuated Green, G (s) | 82.8 | 82.8 | | | 67.5 | | 7.2 | 7.2 | | | | |
| Effective Green, g (s) | 83.8 | 83.8 | | | 68.5 | | 8.2 | 8.2 | | | | |
| Actuated g/C Ratio | 0.84 | 0.84 | | | 0.68 | | 0.08 | 0.08 | | | | |
| Clearance Time (s) | 5.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | | | | |
| Lane Grp Cap (vph) | 553 | 1452 | | | 1161 | | 136 | 122 | | | | |
| v/s Ratio Prot | 0.06 | c0.56 | | | 0.40 | | | 0.00 | | | | |
| v/s Ratio Perm | 0.39 | | | | | | c0.03 | | | | | |
| v/c Ratio | 0.54 | 0.67 | | | 0.59 | | 0.35 | 0.03 | | | | |
| Uniform Delay, d1 | 5.0 | 3.0 | | | 8.3 | | 43.4 | 42.2 | | | | |
| Progression Factor | 1.03 | 1.07 | | | 1.64 | | 1.00 | 1.00 | | | | |
| Incremental Delay, d2 | 0.4 | 0.9 | | | 0.2 | | 1.6 | 0.1 | | | | |
| Delay (s) | 5.6 | 4.1 | | | 13.9 | | 45.0 | 42.3 | | | | |
| Level of Service | A | A | | | B | | D | D | | | | |
| Approach Delay (s) | | 4.4 | | | 13.9 | | | 43.8 | | | 0.0 | |
| Approach LOS | | A | | | B | | | D | | | A | |
























Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 88.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

54: Powers Rd & SE 3rd St

09/30/2019

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  |  |  |  |  |
| Traffic Volume (vph) | 232 | 235 | 490 | 32 | 162 | 37 | 195 | 551 | 21 | 16 | 1081 | 300 |
| Future Volume (vph) | 232 | 235 | 490 | 32 | 162 | 37 | 195 | 551 | 21 | 16 | 1081 | 300 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1662 | 1716 | 1488 | 1662 | 1697 | | 1646 | 3211 | | 1662 | 3149 | |
| Flt Permitted | 0.24 | 1.00 | 1.00 | 0.60 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 412 | 1716 | 1488 | 1046 | 1697 | | 1646 | 3211 | | 1662 | 3149 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 258 | 261 | 544 | 36 | 180 | 41 | 217 | 612 | 23 | 18 | 1201 | 333 |
| RTOR Reduction (vph) | 0 | 0 | 22 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 25 | 0 |
| Lane Group Flow (vph) | 258 | 261 | 522 | 36 | 213 | 0 | 217 | 632 | 0 | 18 | 1509 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | 3 | | 1 | 1 | | 3 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 0% | 0% | 0% | 1% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | pm+pt | NA | pm+ov | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 3 | 8 | 1 | | 4 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 8 | | 8 | 4 | | | | | | | | |
| Actuated Green, G (s) | 28.0 | 28.0 | 40.0 | 13.0 | 13.0 | | 12.0 | 56.8 | | 2.0 | 46.8 | |
| Effective Green, g (s) | 28.0 | 28.0 | 40.0 | 13.0 | 13.0 | | 12.0 | 58.0 | | 2.0 | 48.0 | |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.40 | 0.13 | 0.13 | | 0.12 | 0.58 | | 0.02 | 0.48 | |
| Clearance Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 5.2 | | 4.0 | 5.2 | |
| Vehicle Extension (s) | 3.0 | 3.5 | 2.5 | 3.5 | 3.5 | | 2.5 | 5.2 | | 2.5 | 5.2 | |
| Lane Grp Cap (vph) | 252 | 480 | 654 | 135 | 220 | | 197 | 1862 | | 33 | 1511 | |
| v/s Ratio Prot | c0.11 | 0.15 | c0.10 | | 0.13 | | c0.13 | 0.20 | | 0.01 | c0.48 | |
| v/s Ratio Perm | c0.17 | | 0.26 | 0.03 | | | | | | | | |
| v/c Ratio | 1.02 | 0.54 | 0.80 | 0.27 | 0.97 | | 1.10 | 0.34 | | 0.55 | 1.00 | |
| Uniform Delay, d1 | 33.0 | 30.6 | 26.4 | 39.2 | 43.3 | | 44.0 | 11.0 | | 48.5 | 26.0 | |
| Progression Factor | 1.01 | 1.00 | 0.89 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 57.2 | 1.1 | 5.3 | 1.3 | 51.5 | | 93.9 | 0.5 | | 13.7 | 22.8 | |
| Delay (s) | 90.3 | 31.6 | 28.9 | 40.5 | 94.8 | | 137.9 | 11.5 | | 62.3 | 48.7 | |
| Level of Service | F | C | C | D | F | | F | B | | E | D | |
| Approach Delay (s) | | 44.5 | | | 87.2 | | | 43.7 | | | 48.9 | |
| Approach LOS | | D | | | F | | | D | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 49.1 | | | | HCM 2000 Level of Service | | | D | | |
| HCM 2000 Volume to Capacity ratio | | | 1.06 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | | Sum of lost time (s) | | | 16.0 | | |
| Intersection Capacity Utilization | | | 94.2% | | | | ICU Level of Service | | | F | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis

57: Badger Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 16 | 16 | 64 | 21 | 32 | 21 | 482 | 37 | 27 | 1113 | 95 |
| Future Volume (vph) | 74 | 16 | 16 | 64 | 21 | 32 | 21 | 482 | 37 | 27 | 1113 | 95 |
| Ideal Flow (vphp) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 0.99 | | | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.93 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1629 | 1608 | | | 1643 | 1469 | 1498 | 3195 | | 1662 | 3220 | |
| Flt Permitted | 0.68 | 1.00 | | | 0.76 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1160 | 1608 | | | 1288 | 1469 | 1498 | 3195 | | 1662 | 3220 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 82 | 18 | 18 | 71 | 23 | 36 | 23 | 536 | 41 | 30 | 1237 | 106 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 0 | 31 | 0 | 3 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 82 | 20 | 0 | 0 | 94 | 5 | 23 | 574 | 0 | 30 | 1340 | 0 |
| Confl. Peds. (#/hr) | 1 | | 2 | 2 | | 1 | 1 | | 3 | 3 | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 0% | 2% | 4% | 0% | 11% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | |
| Actuated Green, G (s) | 11.0 | 11.0 | | | 11.0 | 11.0 | 3.7 | 60.1 | | 4.5 | 60.9 | |
| Effective Green, g (s) | 11.5 | 11.5 | | | 11.5 | 11.5 | 4.2 | 61.5 | | 5.0 | 62.3 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | | 0.13 | 0.13 | 0.05 | 0.68 | | 0.06 | 0.69 | |
| Clearance Time (s) | 4.5 | 4.5 | | | 4.5 | 4.5 | 4.5 | 5.4 | | 4.5 | 5.4 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.2 | | 2.5 | 4.7 | |
| Lane Grp Cap (vph) | 148 | 205 | | | 164 | 187 | 69 | 2183 | | 92 | 2228 | |
| v/s Ratio Prot | | 0.01 | | | | | 0.02 | 0.18 | | c0.02 | c0.42 | |
| v/s Ratio Perm | 0.07 | | | | c0.07 | 0.00 | | | | | | |
| v/c Ratio | 0.55 | 0.10 | | | 0.57 | 0.02 | 0.33 | 0.26 | | 0.33 | 0.60 | |
| Uniform Delay, d1 | 36.8 | 34.7 | | | 36.9 | 34.3 | 41.5 | 5.5 | | 40.9 | 7.3 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.4 | 0.3 | | | 5.7 | 0.1 | 3.9 | 0.3 | | 1.5 | 1.2 | |
| Delay (s) | 42.3 | 35.0 | | | 42.6 | 34.4 | 45.4 | 5.8 | | 42.4 | 8.5 | |
| Level of Service | D | C | | | D | C | D | A | | D | A | |
| Approach Delay (s) | | 40.1 | | | 40.4 | | | 7.3 | | | 9.3 | |
| Approach LOS | | D | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 12.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 55.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 153: SB Ramp Terminal & Murphy Rd


















10/02/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|---------------------------|------|------|------|-------|------|------|
| Lane Configurations | | ↗ | | ↖ | ↖ | | | | | ↖ | | ↖ |
| Traffic Volume (vph) | 0 | 413 | 104 | 390 | 265 | 0 | 0 | 0 | 0 | 208 | 0 | 358 |
| Future Volume (vph) | 0 | 413 | 104 | 390 | 265 | 0 | 0 | 0 | 0 | 208 | 0 | 358 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | | 4.0 | | 4.0 | 4.0 | | | | | 4.0 | | 4.0 |
| Lane Util. Factor | | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | | 1.00 |
| Frt | | 0.97 | | 1.00 | 1.00 | | | | | 1.00 | | 0.85 |
| Flt Protected | | 1.00 | | 0.95 | 1.00 | | | | | 0.95 | | 1.00 |
| Satd. Flow (prot) | | 1686 | | 1646 | 1733 | | | | | 1646 | | 1473 |
| Flt Permitted | | 1.00 | | 0.16 | 1.00 | | | | | 0.95 | | 1.00 |
| Satd. Flow (perm) | | 1686 | | 276 | 1733 | | | | | 1646 | | 1473 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 444 | 112 | 419 | 285 | 0 | 0 | 0 | 0 | 224 | 0 | 385 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 302 |
| Lane Group Flow (vph) | 0 | 542 | 0 | 419 | 285 | 0 | 0 | 0 | 0 | 224 | 0 | 83 |
| Heavy Vehicles (%) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Turn Type | | NA | | pm+pt | NA | | | | | Perm | | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | | | | | |
| Permitted Phases | | | | 8 | | | | | | 6 | | 6 |
| Actuated Green, G (s) | | 20.1 | | 38.0 | 38.0 | | | | | 12.0 | | 12.0 |
| Effective Green, g (s) | | 21.1 | | 39.0 | 39.0 | | | | | 13.0 | | 13.0 |
| Actuated g/C Ratio | | 0.35 | | 0.65 | 0.65 | | | | | 0.22 | | 0.22 |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | 5.0 | | 5.0 |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | | 3.0 |
| Lane Grp Cap (vph) | | 592 | | 496 | 1126 | | | | | 356 | | 319 |
| v/s Ratio Prot | | 0.32 | | c0.20 | 0.16 | | | | | | | |
| v/s Ratio Perm | | | | c0.35 | | | | | | c0.14 | | 0.06 |
| v/c Ratio | | 0.92 | | 0.84 | 0.25 | | | | | 0.63 | | 0.26 |
| Uniform Delay, d1 | | 18.6 | | 13.3 | 4.4 | | | | | 21.3 | | 19.5 |
| Progression Factor | | 1.00 | | 1.51 | 1.02 | | | | | 1.00 | | 1.00 |
| Incremental Delay, d2 | | 21.1 | | 10.8 | 0.5 | | | | | 3.5 | | 0.4 |
| Delay (s) | | 39.7 | | 30.9 | 4.9 | | | | | 24.8 | | 20.0 |
| Level of Service | | D | | C | A | | | | | C | | B |
| Approach Delay (s) | | 39.7 | | | 20.4 | | | 0.0 | | | 21.7 | |
| Approach LOS | | D | | | C | | | A | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 26.6 | | | HCM 2000 Level of Service | | | | C | | |
| HCM 2000 Volume to Capacity ratio | | | 0.85 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 60.0 | | | Sum of lost time (s) | | | 13.0 | | | |
| Intersection Capacity Utilization | | | 76.4% | | | ICU Level of Service | | | | D | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 154: NB Ramp Terminal & Murphy Rd

10/02/2019

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  | |  | |  | | | |
| Traffic Volume (vph) | 169 | 452 | 0 | 0 | 577 | 156 | 78 | 0 | 156 | 0 | 0 | 0 |
| Future Volume (vph) | 169 | 452 | 0 | 0 | 577 | 156 | 78 | 0 | 156 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | | 4.0 | | 4.0 | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | | 1.00 | | 1.00 | | | |
| Frt | 1.00 | 1.00 | | | 0.97 | | 1.00 | | 0.85 | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | | 0.95 | | 1.00 | | | |
| Satd. Flow (prot) | 1646 | 1733 | | | 1683 | | 1646 | | 1473 | | | |
| Flt Permitted | 0.15 | 1.00 | | | 1.00 | | 0.95 | | 1.00 | | | |
| Satd. Flow (perm) | 253 | 1733 | | | 1683 | | 1646 | | 1473 | | | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 182 | 486 | 0 | 0 | 620 | 168 | 84 | 0 | 168 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 148 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 182 | 486 | 0 | 0 | 774 | 0 | 84 | 0 | 20 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Turn Type | pm+pt | NA | | | NA | | Perm | | Perm | | | |
| Protected Phases | 7 | 4 | | | 8 | | | | | | | |
| Permitted Phases | 4 | | | | | | 2 | | 2 | | | |
| Actuated Green, G (s) | 44.0 | 44.0 | | | 31.5 | | 6.0 | | 6.0 | | | |
| Effective Green, g (s) | 44.0 | 45.0 | | | 32.5 | | 7.0 | | 7.0 | | | |
| Actuated g/C Ratio | 0.73 | 0.75 | | | 0.54 | | 0.12 | | 0.12 | | | |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | | 5.0 | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 382 | 1299 | | | 911 | | 192 | | 171 | | | |
| v/s Ratio Prot | c0.07 | 0.28 | | | c0.46 | | | | | | | |
| v/s Ratio Perm | 0.28 | | | | | | c0.05 | | 0.01 | | | |
| v/c Ratio | 0.48 | 0.37 | | | 0.85 | | 0.44 | | 0.11 | | | |
| Uniform Delay, d1 | 7.7 | 2.6 | | | 11.7 | | 24.7 | | 23.7 | | | |
| Progression Factor | 2.79 | 1.07 | | | 1.00 | | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | 0.6 | 0.5 | | | 9.8 | | 1.6 | | 0.3 | | | |
| Delay (s) | 22.2 | 3.3 | | | 21.5 | | 26.3 | | 24.0 | | | |
| Level of Service | C | A | | | C | | C | | C | | | |
| Approach Delay (s) | | 8.4 | | | 21.5 | | | 24.8 | | | 0.0 | |
| Approach LOS | | A | | | C | | | C | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 16.9 | | HCM 2000 Level of Service | | | | B | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.74 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 60.0 | | Sum of lost time (s) | | | | 13.0 | | | |
| Intersection Capacity Utilization | | | 109.0% | | ICU Level of Service | | | | G | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c | Critical Lane Group | | | | | | | | | | | |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 13.7 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 142 | 130 | 65 | 281 | 366 | 166 |
| Future Vol, veh/h | 142 | 130 | 65 | 281 | 366 | 166 |
| Conflicting Peds, #/hr | 1 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 3 | 4 | 3 | 3 | 5 | 2 |
| Mvmt Flow | 184 | 169 | 84 | 365 | 475 | 216 |

| Major/Minor | Minor2 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1117 | 583 | 691 | 0 | - | 0 |
| Stage 1 | 583 | - | - | - | - | - |
| Stage 2 | 534 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.24 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.336 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 228 | 508 | 899 | - | - | - |
| Stage 1 | 556 | - | - | - | - | - |
| Stage 2 | 586 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 201 | 508 | 899 | - | - | - |
| Mov Cap-2 Maneuver | 201 | - | - | - | - | - |
| Stage 1 | 491 | - | - | - | - | - |
| Stage 2 | 586 | - | - | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 55.6 | 1.8 | 0 |
| HCM LOS | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|-----------------------|-------|-----|-------|-------|-----|-----|
| Capacity (veh/h) | 899 | - | 201 | 508 | - | - |
| HCM Lane V/C Ratio | 0.094 | - | 0.917 | 0.332 | - | - |
| HCM Control Delay (s) | 9.4 | 0 | 92.3 | 15.6 | - | - |
| HCM Lane LOS | A | A | F | C | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 7.3 | 1.4 | - | - |

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 3 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Vol, veh/h | 16 | 0 | 37 | 5 | 0 | 32 | 101 | 398 | 11 | 58 | 1055 | 37 |
| Future Vol, veh/h | 16 | 0 | 37 | 5 | 0 | 32 | 101 | 398 | 11 | 58 | 1055 | 37 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 1 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 110 | - | 115 | 15 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 17 | 2 | 2 | 0 |
| Mvmt Flow | 17 | 0 | 40 | 5 | 0 | 34 | 109 | 428 | 12 | 62 | 1134 | 40 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|------|--------|------|--------|------|--------|---|---|------|---|---|
| Conflicting Flow All | 1711 | 1941 | 588 | 1347 | 1955 | 224 | 1175 | 0 | 0 | 444 | 0 | 0 |
| Stage 1 | 1279 | 1279 | - | 656 | 656 | - | - | - | - | - | - | - |
| Stage 2 | 432 | 662 | - | 691 | 1299 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.96 | 4.12 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.5 | 4 | 3.33 | 2.21 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 60 | 66 | 457 | 111 | 65 | 776 | 596 | - | - | 1112 | - | - |
| Stage 1 | 179 | 239 | - | 426 | 465 | - | - | - | - | - | - | - |
| Stage 2 | 577 | 462 | - | 406 | 234 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | - | - | - |
| Mov Cap-1 Maneuver | 47 | 51 | 457 | 83 | 50 | 773 | 596 | - | - | 1108 | - | - |
| Mov Cap-2 Maneuver | 47 | 51 | - | 83 | 50 | - | - | - | - | - | - | - |
| Stage 1 | 146 | 225 | - | 347 | 379 | - | - | - | - | - | - | - |
| Stage 2 | 450 | 377 | - | 350 | 221 | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 55.3 | | 16.1 | | 2.5 | | 0.4 | |
| HCM LOS | F | | C | | | | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1WBLn1 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|------------|-------|-------|-----|
| Capacity (veh/h) | 596 | - | - | 126 | 364 | 1108 | - |
| HCM Lane V/C Ratio | 0.182 | - | - | 0.452 | 0.109 | 0.056 | - |
| HCM Control Delay (s) | 12.4 | - | - | 55.3 | 16.1 | 8.4 | - |
| HCM Lane LOS | B | - | - | F | C | A | - |
| HCM 95th %tile Q(veh) | 0.7 | - | - | 2 | 0.4 | 0.2 | - |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 7 | | | | | |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 42 | 5 | 325 | 212 | 10 | 305 |
| Future Vol, veh/h | 42 | 5 | 325 | 212 | 10 | 305 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| 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 | 47 | 6 | 361 | 236 | 11 | 339 |

| Major/Minor | Major1 | Major2 | Minor1 | Minor2 |
|----------------------|--------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 53 | 0 |
| Stage 1 | - | - | - | 50 |
| Stage 2 | - | - | - | 958 |
| Critical Hdwy | - | - | 4.12 | - |
| Critical Hdwy Stg 1 | - | - | - | 5.42 |
| Critical Hdwy Stg 2 | - | - | - | 5.42 |
| Follow-up Hdwy | - | - | 2.218 | - |
| Pot Cap-1 Maneuver | - | - | 1553 | - |
| Stage 1 | - | - | - | 972 |
| Stage 2 | - | - | - | 373 |
| Platoon blocked, % | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | 1553 | - |
| Mov Cap-2 Maneuver | - | - | - | 196 |
| Stage 1 | - | - | - | 712 |
| Stage 2 | - | - | - | 373 |

| Approach | EB | WB | NB |
|----------------------|----|-----|------|
| HCM Control Delay, s | 0 | 4.9 | 11.5 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h) | 898 | - | - | 1553 | - |
| HCM Lane V/C Ratio | 0.39 | - | - | 0.233 | - |
| HCM Control Delay (s) | 11.5 | - | - | 8 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 1.9 | - | - | 0.9 | - |

HCM 6th TWSC
62: Powers Rd & Blakely Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 32.5 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 11 | 678 | 69 | 169 | 660 | 95 | 21 | 5 | 115 | 27 | 5 | 48 |
| Future Vol, veh/h | 11 | 678 | 69 | 169 | 660 | 95 | 21 | 5 | 115 | 27 | 5 | 48 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 33 | 0 | 0 | 1 | 1 | 0 | 8 | 0 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 11 | 706 | 72 | 176 | 688 | 99 | 22 | 5 | 120 | 28 | 5 | 50 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|-----|
| Conflicting Flow All | 790 | 0 | 0 | 778 | 0 | 0 | 1883 | 1906 | 742 | 1920 | 1893 | 743 |
| Stage 1 | - | - | - | - | - | - | 764 | 764 | - | 1093 | 1093 | - |
| Stage 2 | - | - | - | - | - | - | 1119 | 1142 | - | 827 | 800 | - |
| Critical Hdwy | 4.43 | - | - | 4.11 | - | - | 7.18 | 6.5 | 6.22 | 7.1 | 6.5 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.18 | 5.5 | - | 6.1 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.18 | 5.5 | - | 6.1 | 5.5 | - |
| Follow-up Hdwy | 2.497 | - | - | 2.209 | - | - | 3.572 | 4 | 3.318 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 708 | - | - | 843 | - | - | 52 | 69 | 416 | 51 | 71 | 418 |
| Stage 1 | - | - | - | - | - | - | 387 | 416 | - | 262 | 293 | - |
| Stage 2 | - | - | - | - | - | - | 244 | 278 | - | 369 | 400 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 706 | - | - | 843 | - | - | 29 | 42 | 416 | ~ 23 | 43 | 416 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 29 | 42 | - | ~ 23 | 43 | - |
| Stage 1 | - | - | - | - | - | - | 376 | 404 | - | 254 | 182 | - |
| Stage 2 | - | - | - | - | - | - | 129 | 173 | - | 252 | 389 | - |

| Approach | EB | | | WB | | | NB | | | SB | | |
|----------------------|-----|--|--|-----|--|--|-------|--|--|----------|--|--|
| HCM Control Delay, s | 0.1 | | | 1.9 | | | 198.8 | | | \$ 400.9 | | |
| HCM LOS | | | | | | | F | | | F | | |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|----------|
| Capacity (veh/h) | 126 | 706 | - | - | 843 | - | - | 57 |
| HCM Lane V/C Ratio | 1.166 | 0.016 | - | - | 0.209 | - | - | 1.462 |
| HCM Control Delay (s) | 198.8 | 10.2 | 0 | - | 10.4 | 0 | - | \$ 400.9 |
| HCM Lane LOS | F | B | A | - | B | A | - | F |
| HCM 95th %tile Q(veh) | 8.8 | 0 | - | - | 0.8 | - | - | 7.5 |

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 65.4 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ↕ | ↕ | | ↕ | |
| Traffic Vol, veh/h | 11 | 753 | 726 | 175 | 175 | 70 |
| Future Vol, veh/h | 11 | 753 | 726 | 175 | 175 | 70 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 0 | 2 | 1 | 1 | 3 | 0 |
| Mvmt Flow | 11 | 784 | 756 | 182 | 182 | 73 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|---|-----------|
| Conflicting Flow All | 941 | 0 | - | 0 | 1656 850 |
| Stage 1 | - | - | - | - | 850 - |
| Stage 2 | - | - | - | - | 806 - |
| Critical Hdwy | 4.1 | - | - | - | 6.43 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.527 3.3 |
| Pot Cap-1 Maneuver | 737 | - | - | - | ~ 107 363 |
| Stage 1 | - | - | - | - | 417 - |
| Stage 2 | - | - | - | - | 438 - |
| Platoon blocked, % | | - | - | - | |
| Mov Cap-1 Maneuver | 735 | - | - | - | ~ 104 362 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 104 - |
| Stage 1 | - | - | - | - | 405 - |
| Stage 2 | - | - | - | - | 437 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|----------|
| HCM Control Delay, s | 0.1 | 0 | \$ 509.6 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-----------|
| Capacity (veh/h) | 735 | - | - | - | 131 |
| HCM Lane V/C Ratio | 0.016 | - | - | - | 1.948 |
| HCM Control Delay (s) | 10 | 0 | - | - | -\$ 509.6 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 20.3 |

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

Bend Pkwy Powers Int. Murphy Diamond

Vistro File:
X:\...\Roundabouts_PowersInterchange_MurphyDiamond.vist
tro

Scenario: Base Scenario

Report File: X:\...\PowersInterchange_MurphyDiamond.pdf

9/27/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|----|------------------------------|--------------|-----------------|------------|-----|---------------|-----|
| 2 | Powers Rd and Brookwood Blvd | Roundabout | HCM 6th Edition | SB Thru | | 157.8 | F |
| 3 | Murphy Rd and 3rd St | Roundabout | HCM 6th Edition | WB Left | | 62.7 | F |
| 5 | Parrell Rd and Murphy Rd | Roundabout | HCM 6th Edition | EB Thru | | 68.4 | F |
| 6 | US 97 NB ramp and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 12.4 | B |
| 7 | US 97 SB ramp and Murphy Rd | Roundabout | HCM 6th Edition | SB Right | | 24.5 | C |
| 8 | Brookwood Blvd and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 28.0 | D |
| 9 | Murphy Rd and Frontage Rd | Roundabout | HCM 6th Edition | WB Thru | | 7.1 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Powers Rd and Brookwood Blvd

| | | | |
|------------------|-----------------|--------------------|-------|
| Control Type: | Roundabout | Delay (sec / veh): | 157.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 5 | 392 | 203 | 480 | 594 | 42 | 69 | 75 | 5 | 420 | 94 | 215 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 392 | 203 | 480 | 594 | 42 | 69 | 75 | 5 | 420 | 94 | 215 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 107 | 55 | 130 | 161 | 11 | 19 | 20 | 1 | 114 | 26 | 58 |
| Total Analysis Volume [veh/h] | 5 | 426 | 221 | 522 | 646 | 46 | 75 | 82 | 5 | 457 | 102 | 234 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|----|------|----|---|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 693 | | | 575 | | | 1658 | | | 516 | | |
| Exiting Flow Rate [veh/h] | 1130 | | | 750 | | | 156 | | | 842 | | |
| Demand Flow Rate [veh/h] | 5 | 392 | 203 | 480 | 594 | 42 | 69 | 75 | 5 | 420 | 94 | 215 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 426 | 221 | 522 | 646 | 46 | 75 | 82 | 5 | 457 | 102 | 234 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 666 | | | 1239 | | | 166 | | | 809 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 681 | | | 768 | | | 255 | | | 816 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 668 | | | 753 | | | 250 | | | 800 | | |
| X, volume / capacity | 0.98 | | | 1.61 | | | 0.65 | | | 0.99 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|---------|--|--|--------|--|--|--------|--|--|
| Lane LOS | F | | | F | | | E | | | F | | |
| 95th-Percentile Queue Length [veh] | 14.70 | | | 64.73 | | | 4.05 | | | 16.86 | | |
| 95th-Percentile Queue Length [ft] | 367.38 | | | 1618.36 | | | 101.33 | | | 421.56 | | |
| Approach Delay [s/veh] | 54.00 | | | 297.93 | | | 40.96 | | | 52.61 | | |
| Approach LOS | F | | | F | | | E | | | F | | |
| Intersection Delay [s/veh] | 157.83 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 3: Murphy Rd and 3rd St**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 62.7
 Level Of Service: F

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 150.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 42 | 233 | 360 | 224 | 455 | 175 | 223 | 180 | 13 | 371 | 255 | 170 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 3.00 | 11.00 | 2.00 | 2.00 | 0.00 | 2.00 | 1.00 | 0.00 | 3.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 42 | 233 | 360 | 224 | 455 | 175 | 223 | 180 | 13 | 371 | 255 | 170 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 63 | 97 | 60 | 122 | 47 | 60 | 48 | 3 | 100 | 69 | 46 |
| Total Analysis Volume [veh/h] | 45 | 251 | 387 | 241 | 489 | 188 | 240 | 194 | 14 | 399 | 274 | 183 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|------|-----|----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 687 | | | 733 | | | 1156 | | | 548 | | |
| Exiting Flow Rate [veh/h] | 924 | | | 688 | | | 510 | | | 871 | | |
| Demand Flow Rate [veh/h] | 42 | 233 | 360 | 224 | 455 | 175 | 223 | 180 | 13 | 371 | 255 | 170 |
| Adjusted Demand Flow Rate [veh/h] | 45 | 251 | 387 | 241 | 489 | 188 | 240 | 194 | 14 | 399 | 274 | 183 |

Lanes

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Override Calculated Critical Headway | No | No | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Override Calculated Follow-Up Time | No | No | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1420.00 | 1420.00 | 1420.00 | 1420.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00102 |
| HV Adjustment Factor | 0.93 | 0.98 | 0.99 | 0.98 | 1.00 | 0.98 |
| Entry Flow Rate [veh/h] | 732 | 246 | 687 | 441 | 14 | 873 |
| Capacity of Entry and Bypass Lanes [veh/h] | 686 | 729 | 729 | 497 | 497 | 789 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 640 | 715 | 719 | 489 | 497 | 774 |
| X, volume / capacity | 1.07 | 0.34 | 0.94 | 0.89 | 0.03 | 1.11 |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|-------|--------|--------|------|--------|
| Lane LOS | F | A | E | E | A | F |
| 95th-Percentile Queue Length [veh] | 18.97 | 1.49 | 13.54 | 9.80 | 0.09 | 23.76 |
| 95th-Percentile Queue Length [ft] | 474.21 | 37.22 | 338.53 | 244.89 | 2.17 | 594.11 |
| Approach Delay [s/veh] | 80.28 | 35.30 | | 45.28 | | 87.21 |
| Approach LOS | F | E | | E | | F |
| Intersection Delay [s/veh] | 62.71 | | | | | |
| Intersection LOS | F | | | | | |

**Intersection Level Of Service Report
Intersection 5: Parrell Rd and Murphy Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 68.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Parrell Road | | | | | | | | | | | |
|------------------------|--------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Parrell Road | | | | | | | | | | | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 215 | 80 | 48 | 186 | 170 | 111 | 133 | 535 | 260 | 90 | 575 | 164 |
| Base Volume Input [veh/h] | 215 | 80 | 48 | 186 | 170 | 111 | 133 | 535 | 260 | 90 | 575 | 164 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 0.00 | 0.00 | 3.00 | 1.00 | 3.00 | 4.00 | 2.00 | 1.00 | 3.00 | 2.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 215 | 80 | 48 | 186 | 170 | 111 | 133 | 535 | 260 | 90 | 575 | 164 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 56 | 21 | 13 | 48 | 44 | 29 | 35 | 139 | 68 | 23 | 150 | 43 |
| Total Analysis Volume [veh/h] | 224 | 83 | 50 | 194 | 177 | 116 | 139 | 557 | 271 | 94 | 599 | 171 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 913 | | | 932 | | | 475 | | | 452 | | |
| Exiting Flow Rate [veh/h] | 549 | | | 400 | | | 954 | | | 818 | | |
| Demand Flow Rate [veh/h] | 215 | 80 | 48 | 186 | 170 | 111 | 133 | 535 | 260 | 90 | 575 | 164 |
| Adjusted Demand Flow Rate [veh/h] | 224 | 83 | 50 | 194 | 177 | 116 | 139 | 557 | 271 | 94 | 599 | 171 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 1.00 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 357 | | | 499 | | | 987 | | | 881 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 545 | | | 534 | | | 850 | | | 871 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 545 | | | 522 | | | 834 | | | 855 | | |
| X, volume / capacity | 0.66 | | | 0.93 | | | 1.16 | | | 1.01 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | C | | | F | | | F | | | F | | |
| 95th-Percentile Queue Length [veh] | 4.76 | | | 11.52 | | | 29.17 | | | 18.61 | | |
| 95th-Percentile Queue Length [ft] | 118.93 | | | 288.00 | | | 729.26 | | | 465.32 | | |
| Approach Delay [s/veh] | 21.64 | | | 52.50 | | | 105.20 | | | 55.62 | | |
| Approach LOS | C | | | F | | | F | | | F | | |
| Intersection Delay [s/veh] | 68.44 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

Intersection Level Of Service Report
Intersection 8: Brookwood Blvd and Murphy Rd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 28.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|------------------------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Approach | Northeastbound | | | Southwestbound | | | Northwestbound | | | Southeastbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|---|----------------|--------|--------|-----------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 5 | 440 | 180 | 170 | 578 | 58 | 334 | 48 | 127 | 69 | 48 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 2.00 | 0.00 | 1.00 | 1.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 440 | 180 | 170 | 578 | 58 | 334 | 48 | 127 | 69 | 48 | 5 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 118 | 48 | 46 | 155 | 16 | 90 | 13 | 34 | 19 | 13 | 1 |
| Total Analysis Volume [veh/h] | 5 | 473 | 194 | 183 | 622 | 62 | 359 | 52 | 137 | 74 | 52 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|----|-----|----|-----|------|----|---|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 311 | | | 423 | | | 561 | | | 1179 | | |
| Exiting Flow Rate [veh/h] | 999 | | | 696 | | | 431 | | | 119 | | |
| Demand Flow Rate [veh/h] | 5 | 440 | 180 | 170 | 578 | 58 | 334 | 48 | 127 | 69 | 48 | 5 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 473 | 194 | 183 | 622 | 62 | 359 | 52 | 137 | 74 | 52 | 5 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Overwrite Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Overwrite Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.99 | | | 0.99 | | | 0.98 | | | 1.00 | | |
| Entry Flow Rate [veh/h] | 682 | | | 876 | | | 558 | | | 131 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 1006 | | | 897 | | | 779 | | | 415 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 992 | | | 888 | | | 765 | | | 415 | | |
| X, volume / capacity | 0.68 | | | 0.98 | | | 0.72 | | | 0.32 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|-------|--|--|
| Lane LOS | B | | | E | | | C | | | B | | |
| 95th-Percentile Queue Length [veh] | 5.55 | | | 16.77 | | | 6.18 | | | 1.34 | | |
| 95th-Percentile Queue Length [ft] | 138.64 | | | 419.17 | | | 154.54 | | | 33.40 | | |
| Approach Delay [s/veh] | 14.30 | | | 46.15 | | | 19.27 | | | 14.23 | | |
| Approach LOS | B | | | E | | | C | | | B | | |
| Intersection Delay [s/veh] | 27.98 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 9: Murphy Rd and Frontage Rd**

| | | | |
|------------------|-----------------|--------------------|-----|
| Control Type: | Roundabout | Delay (sec / veh): | 7.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|------------------------|-------------|--------|-----------|--------|-----------|--------|
| Approach | Northbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Thru | Right | Left | Thru |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | 30.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | Yes | | Yes | | Yes | |

Volumes

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|---|-------------|--------|-----------|--------|-----------|--------|
| Base Volume Input [veh/h] | 154 | 119 | 297 | 101 | 117 | 355 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 119 | 297 | 101 | 117 | 355 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 32 | 80 | 27 | 31 | 95 |
| Total Analysis Volume [veh/h] | 166 | 128 | 319 | 109 | 126 | 382 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

Intersection Settings

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | 1 | | 1 | |
| Circulating Flow Rate [veh/h] | 322 | | 127 | | 168 | |
| Exiting Flow Rate [veh/h] | 237 | | 553 | | 451 | |
| Demand Flow Rate [veh/h] | 154 | 119 | 297 | 101 | 117 | 355 |
| Adjusted Demand Flow Rate [veh/h] | 166 | 128 | 319 | 109 | 126 | 382 |

Lanes

| | | | | | | |
|--|---------|--|---------|--|---------|--|
| Override Calculated Critical Headway | No | | No | | No | |
| User-Defined Critical Headway [s] | 4.00 | | 4.00 | | 4.00 | |
| Override Calculated Follow-Up Time | No | | No | | No | |
| User-Defined Follow-Up Time [s] | 3.00 | | 3.00 | | 3.00 | |
| A (intercept) | 1380.00 | | 1380.00 | | 1380.00 | |
| B (coefficient) | 0.00102 | | 0.00102 | | 0.00102 | |
| HV Adjustment Factor | 0.99 | | 0.99 | | 0.99 | |
| Entry Flow Rate [veh/h] | 297 | | 433 | | 514 | |
| Capacity of Entry and Bypass Lanes [veh/h] | 994 | | 1213 | | 1164 | |
| Pedestrian Impedance | 1.00 | | 1.00 | | 1.00 | |
| Capacity per Entry Lane [veh/h] | 984 | | 1201 | | 1152 | |
| X, volume / capacity | 0.30 | | 0.36 | | 0.44 | |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|-------|--|-------|--|-------|--|
| Lane LOS | A | | A | | A | |
| 95th-Percentile Queue Length [veh] | 1.26 | | 1.64 | | 2.30 | |
| 95th-Percentile Queue Length [ft] | 31.51 | | 40.89 | | 57.55 | |
| Approach Delay [s/veh] | 6.71 | | 6.44 | | 7.78 | |
| Approach LOS | A | | A | | A | |
| Intersection Delay [s/veh] | | | 7.05 | | | |
| Intersection LOS | | | A | | | |

2040 30HV Powers Interchange and Murphy Loops + Frontage HCM

HCM Signalized Intersection Capacity Analysis

22: US 97 SB Ramp & Powers Rd

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|-------|-------|------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | | ↖ | ↗ | | | | | | ↖ | ↗ |
| Traffic Volume (vph) | 0 | 647 | 143 | 46 | 477 | 0 | 0 | 0 | 0 | 423 | 0 | 416 |
| Future Volume (vph) | 0 | 647 | 143 | 46 | 477 | 0 | 0 | 0 | 0 | 423 | 0 | 416 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | | 4.0 | | 4.0 | 4.0 | | | | | | 4.0 | 4.0 |
| Lane Util. Factor | | 1.00 | | 1.00 | 1.00 | | | | | | 1.00 | 1.00 |
| Frt | | 0.98 | | 1.00 | 1.00 | | | | | | 1.00 | 0.85 |
| Flt Protected | | 1.00 | | 0.95 | 1.00 | | | | | | 0.95 | 1.00 |
| Satd. Flow (prot) | | 1698 | | 1662 | 1750 | | | | | | 1662 | 1488 |
| Flt Permitted | | 1.00 | | 0.12 | 1.00 | | | | | | 0.95 | 1.00 |
| Satd. Flow (perm) | | 1698 | | 216 | 1750 | | | | | | 1662 | 1488 |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 0 | 681 | 151 | 48 | 502 | 0 | 0 | 0 | 0 | 445 | 0 | 438 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 253 |
| Lane Group Flow (vph) | 0 | 824 | 0 | 48 | 502 | 0 | 0 | 0 | 0 | 0 | 445 | 185 |
| Heavy Vehicles (%) | 0% | 0% | 3% | 0% | 0% | 0% | 33% | 0% | 1% | 0% | 0% | 0% |
| Turn Type | | NA | | pm+pt | NA | | | | | Perm | NA | Perm |
| Protected Phases | | 8 | | 7 | 4 | | | | | | 2 | |
| Permitted Phases | | | | 4 | | | | | | 2 | | 2 |
| Actuated Green, G (s) | | 54.2 | | 62.5 | 62.5 | | | | | | 27.5 | 27.5 |
| Effective Green, g (s) | | 55.2 | | 63.5 | 63.5 | | | | | | 28.5 | 28.5 |
| Actuated g/C Ratio | | 0.55 | | 0.64 | 0.64 | | | | | | 0.28 | 0.28 |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | | 5.0 | 5.0 |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | | 937 | | 199 | 1111 | | | | | | 473 | 424 |
| v/s Ratio Prot | | c0.49 | | 0.01 | c0.29 | | | | | | | |
| v/s Ratio Perm | | | | 0.14 | | | | | | | 0.27 | 0.12 |
| v/c Ratio | | 0.88 | | 0.24 | 0.45 | | | | | | 0.94 | 0.44 |
| Uniform Delay, d1 | | 19.5 | | 14.9 | 9.3 | | | | | | 34.9 | 29.2 |
| Progression Factor | | 1.00 | | 1.47 | 1.78 | | | | | | 1.00 | 1.00 |
| Incremental Delay, d2 | | 11.6 | | 0.6 | 1.2 | | | | | | 27.1 | 0.7 |
| Delay (s) | | 31.1 | | 22.5 | 17.8 | | | | | | 62.0 | 29.9 |
| Level of Service | | C | | C | B | | | | | | E | C |
| Approach Delay (s) | | 31.1 | | | 18.2 | | | 0.0 | | | 46.1 | |
| Approach LOS | | C | | | B | | | A | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 33.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 85.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

24: Powers Rd & US 97 NB Ramp

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|-------|-------|------|------|------|-------|------|------|------|------|------|
| Lane Configurations | ↖ | ↑ | | | ↗ | | ↖ | ↗ | | | | |
| Traffic Volume (vph) | 286 | 784 | 0 | 0 | 477 | 130 | 46 | 0 | 39 | 0 | 0 | 0 |
| Future Volume (vph) | 286 | 784 | 0 | 0 | 477 | 130 | 46 | 0 | 39 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | | 4.0 | 4.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | 0.97 | | 1.00 | 0.85 | | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (prot) | 1646 | 1733 | | | 1696 | | 1662 | 1488 | | | | |
| Flt Permitted | 0.32 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (perm) | 559 | 1733 | | | 1696 | | 1662 | 1488 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 301 | 825 | 0 | 0 | 502 | 137 | 48 | 0 | 41 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 38 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 301 | 825 | 0 | 0 | 633 | 0 | 48 | 3 | 0 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | | | |
| Protected Phases | 3 | 8 | | | 4 | | | 6 | | | | |
| Permitted Phases | 8 | | | | | | 6 | | | | | |
| Actuated Green, G (s) | 82.8 | 82.8 | | | 67.8 | | 7.2 | 7.2 | | | | |
| Effective Green, g (s) | 83.8 | 83.8 | | | 68.8 | | 8.2 | 8.2 | | | | |
| Actuated g/C Ratio | 0.84 | 0.84 | | | 0.69 | | 0.08 | 0.08 | | | | |
| Clearance Time (s) | 5.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | | | | |
| Lane Grp Cap (vph) | 588 | 1452 | | | 1166 | | 136 | 122 | | | | |
| v/s Ratio Prot | 0.06 | c0.48 | | | 0.37 | | | 0.00 | | | | |
| v/s Ratio Perm | 0.37 | | | | | | c0.03 | | | | | |
| v/c Ratio | 0.51 | 0.57 | | | 0.54 | | 0.35 | 0.03 | | | | |
| Uniform Delay, d1 | 4.1 | 2.5 | | | 7.8 | | 43.4 | 42.2 | | | | |
| Progression Factor | 0.31 | 0.32 | | | 0.50 | | 1.00 | 1.00 | | | | |
| Incremental Delay, d2 | 0.3 | 0.7 | | | 0.6 | | 1.6 | 0.1 | | | | |
| Delay (s) | 1.6 | 1.5 | | | 4.5 | | 45.0 | 42.3 | | | | |
| Level of Service | A | A | | | A | | D | D | | | | |
| Approach Delay (s) | | 1.6 | | | 4.5 | | | 43.8 | | | 0.0 | |
| Approach LOS | | A | | | A | | | D | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 4.6 | | | | | | | | | A |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | | | | 12.0 | | | |
| Intersection Capacity Utilization | | | 85.2% | | | | | | | | | E |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis

54: Powers Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|------|---------------------------|-------|------|------|------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 235 | 218 | 370 | 32 | 155 | 37 | 165 | 551 | 21 | 16 | 975 | 287 |
| Future Volume (vph) | 235 | 218 | 370 | 32 | 155 | 37 | 165 | 551 | 21 | 16 | 975 | 287 |
| Ideal Flow (vphp) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1662 | 1716 | 1488 | 1662 | 1695 | | 1646 | 3211 | | 1662 | 3143 | |
| Flt Permitted | 0.23 | 1.00 | 1.00 | 0.61 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 409 | 1716 | 1488 | 1065 | 1695 | | 1646 | 3211 | | 1662 | 3143 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 261 | 242 | 411 | 36 | 172 | 41 | 183 | 612 | 23 | 18 | 1083 | 319 |
| RTOR Reduction (vph) | 0 | 0 | 24 | 0 | 9 | 0 | 0 | 3 | 0 | 0 | 27 | 0 |
| Lane Group Flow (vph) | 261 | 242 | 387 | 36 | 204 | 0 | 183 | 632 | 0 | 18 | 1375 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | 3 | | 1 | 1 | | 3 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 0% | 0% | 0% | 1% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | pm+pt | NA | pm+ov | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 3 | 8 | 1 | | 4 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 8 | | 8 | 4 | | | | | | | | |
| Actuated Green, G (s) | 31.0 | 31.0 | 42.8 | 13.1 | 13.1 | | 11.8 | 53.8 | | 2.0 | 44.0 | |
| Effective Green, g (s) | 31.0 | 31.0 | 42.8 | 13.1 | 13.1 | | 11.8 | 55.0 | | 2.0 | 45.2 | |
| Actuated g/C Ratio | 0.31 | 0.31 | 0.43 | 0.13 | 0.13 | | 0.12 | 0.55 | | 0.02 | 0.45 | |
| Clearance Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 5.2 | | 4.0 | 5.2 | |
| Vehicle Extension (s) | 3.0 | 3.5 | 2.5 | 3.5 | 3.5 | | 2.5 | 5.2 | | 2.5 | 5.2 | |
| Lane Grp Cap (vph) | 300 | 531 | 696 | 139 | 222 | | 194 | 1766 | | 33 | 1420 | |
| v/s Ratio Prot | c0.12 | 0.14 | c0.07 | | 0.12 | | c0.11 | 0.20 | | 0.01 | c0.44 | |
| v/s Ratio Perm | c0.15 | | 0.19 | 0.03 | | | | | | | | |
| v/c Ratio | 0.87 | 0.46 | 0.56 | 0.26 | 0.92 | | 0.94 | 0.36 | | 0.55 | 0.97 | |
| Uniform Delay, d1 | 29.1 | 27.7 | 21.5 | 39.1 | 42.9 | | 43.8 | 12.6 | | 48.5 | 26.7 | |
| Progression Factor | 1.25 | 1.24 | 1.16 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 20.3 | 0.6 | 0.7 | 1.2 | 39.5 | | 48.3 | 0.6 | | 13.7 | 17.4 | |
| Delay (s) | 56.7 | 34.9 | 25.6 | 40.3 | 82.5 | | 92.0 | 13.2 | | 62.3 | 44.1 | |
| Level of Service | E | C | C | D | F | | F | B | | E | D | |
| Approach Delay (s) | | 36.9 | | | 76.4 | | | 30.8 | | | 44.3 | |
| Approach LOS | | D | | | E | | | C | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 41.4 | | | HCM 2000 Level of Service | | | | D | | |
| HCM 2000 Volume to Capacity ratio | | | 0.96 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | Sum of lost time (s) | | | | 16.0 | | |
| Intersection Capacity Utilization | | | 88.6% | | | ICU Level of Service | | | | E | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

57: Badger Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 16 | 16 | 64 | 21 | 32 | 21 | 498 | 37 | 27 | 1034 | 95 |
| Future Volume (vph) | 74 | 16 | 16 | 64 | 21 | 32 | 21 | 498 | 37 | 27 | 1034 | 95 |
| Ideal Flow (vphp) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 0.99 | | | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.93 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1629 | 1608 | | | 1643 | 1469 | 1498 | 3196 | | 1662 | 3218 | |
| Flt Permitted | 0.68 | 1.00 | | | 0.76 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1160 | 1608 | | | 1288 | 1469 | 1498 | 3196 | | 1662 | 3218 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 82 | 18 | 18 | 71 | 23 | 36 | 23 | 553 | 41 | 30 | 1149 | 106 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 0 | 31 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 82 | 20 | 0 | 0 | 94 | 5 | 23 | 591 | 0 | 30 | 1251 | 0 |
| Confl. Peds. (#/hr) | 1 | | 2 | 2 | | 1 | 1 | | 3 | 3 | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 0% | 2% | 4% | 0% | 11% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | |
| Actuated Green, G (s) | 11.0 | 11.0 | | | 11.0 | 11.0 | 3.7 | 60.1 | | 4.5 | 60.9 | |
| Effective Green, g (s) | 11.5 | 11.5 | | | 11.5 | 11.5 | 4.2 | 61.5 | | 5.0 | 62.3 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | | 0.13 | 0.13 | 0.05 | 0.68 | | 0.06 | 0.69 | |
| Clearance Time (s) | 4.5 | 4.5 | | | 4.5 | 4.5 | 4.5 | 5.4 | | 4.5 | 5.4 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.2 | | 2.5 | 4.7 | |
| Lane Grp Cap (vph) | 148 | 205 | | | 164 | 187 | 69 | 2183 | | 92 | 2227 | |
| v/s Ratio Prot | | 0.01 | | | | | 0.02 | 0.18 | | c0.02 | c0.39 | |
| v/s Ratio Perm | 0.07 | | | | c0.07 | 0.00 | | | | | | |
| v/c Ratio | 0.55 | 0.10 | | | 0.57 | 0.02 | 0.33 | 0.27 | | 0.33 | 0.56 | |
| Uniform Delay, d1 | 36.8 | 34.7 | | | 36.9 | 34.3 | 41.5 | 5.5 | | 40.9 | 7.0 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.4 | 0.3 | | | 5.7 | 0.1 | 3.9 | 0.3 | | 1.5 | 1.0 | |
| Delay (s) | 42.3 | 35.0 | | | 42.6 | 34.4 | 45.4 | 5.8 | | 42.4 | 8.0 | |
| Level of Service | D | C | | | D | C | D | A | | D | A | |
| Approach Delay (s) | | 40.1 | | | 40.4 | | | 7.3 | | | 8.8 | |
| Approach LOS | | D | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 12.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 53.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 10 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 135 | 120 | 64 | 281 | 323 | 160 |
| Future Vol, veh/h | 135 | 120 | 64 | 281 | 323 | 160 |
| Conflicting Peds, #/hr | 1 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 3 | 4 | 3 | 3 | 5 | 2 |
| Mvmt Flow | 175 | 156 | 83 | 365 | 419 | 208 |

| Major/Minor | Minor2 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1055 | 523 | 627 | 0 | - | 0 |
| Stage 1 | 523 | - | - | - | - | - |
| Stage 2 | 532 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.24 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.336 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 249 | 550 | 950 | - | - | - |
| Stage 1 | 593 | - | - | - | - | - |
| Stage 2 | 587 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 222 | 550 | 950 | - | - | - |
| Mov Cap-2 Maneuver | 222 | - | - | - | - | - |
| Stage 1 | 528 | - | - | - | - | - |
| Stage 2 | 587 | - | - | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 40.2 | 1.7 | 0 |
| HCM LOS | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|-----------------------|-------|-----|-------|-------|-----|-----|
| Capacity (veh/h) | 950 | - | 222 | 550 | - | - |
| HCM Lane V/C Ratio | 0.087 | - | 0.79 | 0.283 | - | - |
| HCM Control Delay (s) | 9.2 | 0 | 63.4 | 14.1 | - | - |
| HCM Lane LOS | A | A | F | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 5.7 | 1.2 | - | - |

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 2.9 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Vol, veh/h | 16 | 0 | 42 | 5 | 0 | 32 | 101 | 413 | 11 | 58 | 975 | 37 |
| Future Vol, veh/h | 16 | 0 | 42 | 5 | 0 | 32 | 101 | 413 | 11 | 58 | 975 | 37 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 1 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 110 | - | 115 | 15 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 17 | 2 | 2 | 0 |
| Mvmt Flow | 17 | 0 | 45 | 5 | 0 | 34 | 109 | 444 | 12 | 62 | 1048 | 40 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|------|--------|------|--------|------|--------|---|---|------|---|---|
| Conflicting Flow All | 1633 | 1871 | 545 | 1320 | 1885 | 232 | 1089 | 0 | 0 | 460 | 0 | 0 |
| Stage 1 | 1193 | 1193 | - | 672 | 672 | - | - | - | - | - | - | - |
| Stage 2 | 440 | 678 | - | 648 | 1213 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.96 | 4.12 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.5 | 4 | 3.33 | 2.21 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 68 | 73 | 488 | 117 | 71 | 767 | 642 | - | - | 1097 | - | - |
| Stage 1 | 202 | 263 | - | 416 | 458 | - | - | - | - | - | - | - |
| Stage 2 | 571 | 455 | - | 430 | 257 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | - | - | - |
| Mov Cap-1 Maneuver | 54 | 57 | 488 | 88 | 55 | 764 | 641 | - | - | 1093 | - | - |
| Mov Cap-2 Maneuver | 54 | 57 | - | 88 | 55 | - | - | - | - | - | - | - |
| Stage 1 | 167 | 248 | - | 344 | 379 | - | - | - | - | - | - | - |
| Stage 2 | 453 | 377 | - | 368 | 242 | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 44.3 | | 15.7 | | 2.3 | | 0.5 | |
| HCM LOS | E | | C | | | | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1WBLn1 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|------------|-------|-------|-----|
| Capacity (veh/h) | 641 | - | - | 152 | 375 | 1093 | - |
| HCM Lane V/C Ratio | 0.169 | - | - | 0.41 | 0.106 | 0.057 | - |
| HCM Control Delay (s) | 11.8 | - | - | 44.3 | 15.7 | 8.5 | - |
| HCM Lane LOS | B | - | - | E | C | A | - |
| HCM 95th %tile Q(veh) | 0.6 | - | - | 1.8 | 0.4 | 0.2 | - |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 5.1 | | | | | |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 371 | 5 | 285 | 254 | 10 | 160 |
| Future Vol, veh/h | 371 | 5 | 285 | 254 | 10 | 160 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| 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 | 412 | 6 | 317 | 282 | 11 | 178 |

| Major/Minor | Major1 | Major2 | Minor1 | Minor2 | Minor3 |
|----------------------|--------|--------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 418 | 0 | 1331 |
| Stage 1 | - | - | - | - | 415 |
| Stage 2 | - | - | - | - | 916 |
| Critical Hdwy | - | - | 4.12 | - | 6.42 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 |
| Pot Cap-1 Maneuver | - | - | 1141 | - | 170 |
| Stage 1 | - | - | - | - | 666 |
| Stage 2 | - | - | - | - | 390 |
| Platoon blocked, % | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | 1141 | - | 114 |
| Mov Cap-2 Maneuver | - | - | - | - | 114 |
| Stage 1 | - | - | - | - | 447 |
| Stage 2 | - | - | - | - | 390 |

| Approach | EB | WB | NB |
|----------------------|----|----|------|
| HCM Control Delay, s | 0 | 5 | 16.4 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h) | 502 | - | - | 1141 | - |
| HCM Lane V/C Ratio | 0.376 | - | - | 0.278 | - |
| HCM Control Delay (s) | 16.4 | - | - | 9.4 | 0 |
| HCM Lane LOS | C | - | - | A | A |
| HCM 95th %tile Q(veh) | 1.7 | - | - | 1.1 | - |

HCM 6th TWSC
62: Powers Rd & Blakely Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 22.7 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 11 | 683 | 69 | 170 | 625 | 98 | 21 | 5 | 80 | 27 | 5 | 48 |
| Future Vol, veh/h | 11 | 683 | 69 | 170 | 625 | 98 | 21 | 5 | 80 | 27 | 5 | 48 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 33 | 0 | 0 | 1 | 1 | 0 | 8 | 0 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 11 | 711 | 72 | 177 | 651 | 102 | 22 | 5 | 83 | 28 | 5 | 50 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|-----|
| Conflicting Flow All | 756 | 0 | 0 | 783 | 0 | 0 | 1855 | 1879 | 747 | 1872 | 1864 | 707 |
| Stage 1 | - | - | - | - | - | - | 769 | 769 | - | 1059 | 1059 | - |
| Stage 2 | - | - | - | - | - | - | 1086 | 1110 | - | 813 | 805 | - |
| Critical Hdwy | 4.43 | - | - | 4.11 | - | - | 7.18 | 6.5 | 6.22 | 7.1 | 6.5 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.18 | 5.5 | - | 6.1 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.18 | 5.5 | - | 6.1 | 5.5 | - |
| Follow-up Hdwy | 2.497 | - | - | 2.209 | - | - | 3.572 | 4 | 3.318 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 731 | - | - | 840 | - | - | 55 | 72 | 413 | 56 | 74 | 439 |
| Stage 1 | - | - | - | - | - | - | 385 | 413 | - | 274 | 304 | - |
| Stage 2 | - | - | - | - | - | - | 255 | 287 | - | 375 | 398 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 729 | - | - | 840 | - | - | 31 | 44 | 413 | 29 | 45 | 437 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 31 | 44 | - | 29 | 45 | - |
| Stage 1 | - | - | - | - | - | - | 375 | 402 | - | 266 | 191 | - |
| Stage 2 | - | - | - | - | - | - | 138 | 181 | - | 287 | 387 | - |

| Approach | EB | WB | NB | SB |
|----------------------|-----|----|-------|-------|
| HCM Control Delay, s | 0.1 | 2 | 167.3 | 278.7 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h) | 108 | 729 | - | - | 840 | - | - | 69 |
| HCM Lane V/C Ratio | 1.022 | 0.016 | - | - | 0.211 | - | - | 1.208 |
| HCM Control Delay (s) | 167.3 | 10 | 0 | - | 10.4 | 0 | - | 278.7 |
| HCM Lane LOS | F | B | A | - | B | A | - | F |
| HCM 95th %tile Q(veh) | 6.6 | 0 | - | - | 0.8 | - | - | 6.6 |

HCM 6th TWSC
155: Murphy Rd & Old Murphy Rd

09/30/2019

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 22.4 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ↕ | ↕ | | ↕ | |
| Traffic Vol, veh/h | 11 | 763 | 720 | 201 | 106 | 70 |
| Future Vol, veh/h | 11 | 763 | 720 | 201 | 106 | 70 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 0 | 2 | 1 | 1 | 3 | 0 |
| Mvmt Flow | 11 | 795 | 750 | 209 | 110 | 73 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|---|-----------|
| Conflicting Flow All | 962 | 0 | - | 0 | 1675 858 |
| Stage 1 | - | - | - | - | 858 - |
| Stage 2 | - | - | - | - | 817 - |
| Critical Hdwy | 4.1 | - | - | - | 6.43 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.527 3.3 |
| Pot Cap-1 Maneuver | 724 | - | - | - | ~ 104 359 |
| Stage 1 | - | - | - | - | 414 - |
| Stage 2 | - | - | - | - | 433 - |
| Platoon blocked, % | | - | - | - | |
| Mov Cap-1 Maneuver | 722 | - | - | - | ~ 101 358 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 101 - |
| Stage 1 | - | - | - | - | 402 - |
| Stage 2 | - | - | - | - | 432 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|-------|
| HCM Control Delay, s | 0.1 | 0 | 237.7 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 722 | - | - | - | 141 |
| HCM Lane V/C Ratio | 0.016 | - | - | - | 1.3 |
| HCM Control Delay (s) | 10.1 | 0 | - | - | 237.7 |
| HCM Lane LOS | B | A | - | - | F |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 11.3 |

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

Bend Pkwy Powers Int. Murphy Frontage

Vistro File:

Scenario: Base Scenario

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tro

Report File: X:\...\PowersInterchange_MurphyFrontage.pdf

9/27/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|----|------------------------------|--------------|-----------------|------------|-----|---------------|-----|
| 2 | Powers Rd and Brookwood Blvd | Roundabout | HCM 6th Edition | SB Thru | | 142.2 | F |
| 3 | Murphy Rd and 3rd St | Roundabout | HCM 6th Edition | EB Thru | | 81.3 | F |
| 5 | Parrell Rd and Murphy Rd | Roundabout | HCM 6th Edition | EB Thru | | 43.5 | E |
| 8 | Brookwood Blvd and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 48.2 | E |
| 9 | Murphy Rd and Frontage Rd | Roundabout | HCM 6th Edition | NB Right | | 10.2 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Powers Rd and Brookwood Blvd

| | | | |
|------------------|-----------------|--------------------|-------|
| Control Type: | Roundabout | Delay (sec / veh): | 142.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 5 | 392 | 199 | 490 | 590 | 42 | 48 | 74 | 5 | 385 | 89 | 220 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 392 | 199 | 490 | 590 | 42 | 48 | 74 | 5 | 385 | 89 | 220 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 107 | 54 | 133 | 160 | 11 | 13 | 20 | 1 | 105 | 24 | 60 |
| Total Analysis Volume [veh/h] | 5 | 426 | 216 | 533 | 641 | 46 | 52 | 80 | 5 | 418 | 97 | 239 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|----|------|----|---|-----|----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 678 | | | 530 | | | 1624 | | | 493 | | |
| Exiting Flow Rate [veh/h] | 1085 | | | 731 | | | 151 | | | 846 | | |
| Demand Flow Rate [veh/h] | 5 | 392 | 199 | 490 | 590 | 42 | 48 | 74 | 5 | 385 | 89 | 220 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 426 | 216 | 533 | 641 | 46 | 52 | 80 | 5 | 418 | 97 | 239 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 660 | | | 1245 | | | 140 | | | 770 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 691 | | | 804 | | | 264 | | | 835 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 678 | | | 788 | | | 259 | | | 819 | | |
| X, volume / capacity | 0.96 | | | 1.55 | | | 0.53 | | | 0.92 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|---------|--|--|-------|--|--|--------|--|--|
| Lane LOS | E | | | F | | | D | | | E | | |
| 95th-Percentile Queue Length [veh] | 13.80 | | | 61.49 | | | 2.85 | | | 13.26 | | |
| 95th-Percentile Queue Length [ft] | 344.88 | | | 1537.17 | | | 71.34 | | | 331.46 | | |
| Approach Delay [s/veh] | 48.86 | | | 268.88 | | | 31.33 | | | 37.50 | | |
| Approach LOS | E | | | F | | | D | | | E | | |
| Intersection Delay [s/veh] | 142.21 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 3: Murphy Rd and 3rd St**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 81.3
 Level Of Service: F

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 150.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 42 | 175 | 164 | 255 | 436 | 276 | 286 | 355 | 208 | 260 | 355 | 175 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 3.00 | 11.00 | 2.00 | 2.00 | 0.00 | 2.00 | 1.00 | 0.00 | 3.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 42 | 175 | 164 | 255 | 436 | 276 | 286 | 355 | 208 | 260 | 355 | 175 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 47 | 44 | 69 | 117 | 74 | 77 | 95 | 56 | 70 | 95 | 47 |
| Total Analysis Volume [veh/h] | 45 | 188 | 176 | 274 | 469 | 297 | 308 | 382 | 224 | 280 | 382 | 188 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 979 | | | 719 | | | 1046 | | | 553 | | |
| Exiting Flow Rate [veh/h] | 991 | | | 698 | | | 728 | | | 861 | | |
| Demand Flow Rate [veh/h] | 42 | 175 | 164 | 255 | 436 | 276 | 286 | 355 | 208 | 260 | 355 | 175 |
| Adjusted Demand Flow Rate [veh/h] | 45 | 188 | 176 | 274 | 469 | 297 | 308 | 382 | 224 | 280 | 382 | 188 |

Lanes

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Override Calculated Critical Headway | No | No | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Override Calculated Follow-Up Time | No | No | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1420.00 | 1420.00 | 1420.00 | 1420.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00102 |
| HV Adjustment Factor | 0.94 | 0.98 | 0.99 | 0.99 | 1.00 | 0.98 |
| Entry Flow Rate [veh/h] | 434 | 280 | 776 | 700 | 224 | 865 |
| Capacity of Entry and Bypass Lanes [veh/h] | 509 | 738 | 738 | 549 | 549 | 786 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 480 | 724 | 730 | 541 | 549 | 773 |
| X, volume / capacity | 0.85 | 0.38 | 1.05 | 1.28 | 0.41 | 1.10 |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|-------|--------|--------|-------|--------|
| Lane LOS | E | A | F | F | B | F |
| 95th-Percentile Queue Length [veh] | 8.73 | 1.77 | 19.41 | 27.97 | 1.98 | 23.34 |
| 95th-Percentile Queue Length [ft] | 218.28 | 44.32 | 485.23 | 699.31 | 49.43 | 583.58 |
| Approach Delay [s/veh] | 41.69 | 54.86 | | 125.44 | | 85.31 |
| Approach LOS | E | F | | F | | F |
| Intersection Delay [s/veh] | 81.32 | | | | | |
| Intersection LOS | F | | | | | |

**Intersection Level Of Service Report
Intersection 5: Parrell Rd and Murphy Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 43.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Parrell Road | | | | | | | | | | | |
|------------------------|--------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Parrell Road | | | | | | | | | | | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 200 | 85 | 48 | 186 | 127 | 111 | 122 | 599 | 148 | 64 | 610 | 133 |
| Base Volume Input [veh/h] | 200 | 85 | 48 | 186 | 127 | 111 | 122 | 599 | 148 | 64 | 610 | 133 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 0.00 | 0.00 | 3.00 | 1.00 | 3.00 | 4.00 | 2.00 | 1.00 | 3.00 | 2.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 200 | 85 | 48 | 186 | 127 | 111 | 122 | 599 | 148 | 64 | 610 | 133 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 52 | 22 | 13 | 48 | 33 | 29 | 32 | 156 | 39 | 17 | 159 | 35 |
| Total Analysis Volume [veh/h] | 208 | 89 | 50 | 194 | 132 | 116 | 127 | 624 | 154 | 67 | 635 | 139 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 968 | | | 925 | | | 402 | | | 429 | | |
| Exiting Flow Rate [veh/h] | 358 | | | 361 | | | 975 | | | 886 | | |
| Demand Flow Rate [veh/h] | 200 | 85 | 48 | 186 | 127 | 111 | 122 | 599 | 148 | 64 | 610 | 133 |
| Adjusted Demand Flow Rate [veh/h] | 208 | 89 | 50 | 194 | 132 | 116 | 127 | 624 | 154 | 67 | 635 | 139 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 1.00 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 347 | | | 453 | | | 925 | | | 858 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 514 | | | 538 | | | 916 | | | 891 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 514 | | | 525 | | | 897 | | | 875 | | |
| X, volume / capacity | 0.68 | | | 0.84 | | | 1.01 | | | 0.96 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | C | | | E | | | F | | | E | | |
| 95th-Percentile Queue Length [veh] | 5.03 | | | 8.70 | | | 18.94 | | | 15.81 | | |
| 95th-Percentile Queue Length [ft] | 125.64 | | | 217.53 | | | 473.55 | | | 395.20 | | |
| Approach Delay [s/veh] | 23.72 | | | 37.70 | | | 53.82 | | | 43.48 | | |
| Approach LOS | C | | | E | | | F | | | E | | |
| Intersection Delay [s/veh] | 43.46 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |

Intersection Level Of Service Report
Intersection 8: Brookwood Blvd and Murphy Rd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 48.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|------------------------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Approach | Northeastbound | | | Southwestbound | | | Northwestbound | | | Southeastbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|---|----------------|--------|--------|-----------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 5 | 472 | 170 | 170 | 641 | 58 | 297 | 101 | 180 | 170 | 85 | 16 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 2.00 | 0.00 | 1.00 | 1.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 472 | 170 | 170 | 641 | 58 | 297 | 101 | 180 | 170 | 85 | 16 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 127 | 46 | 46 | 172 | 16 | 80 | 27 | 48 | 46 | 23 | 4 |
| Total Analysis Volume [veh/h] | 5 | 508 | 183 | 183 | 689 | 62 | 319 | 109 | 194 | 183 | 91 | 17 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|----|-----|-----|-----|------|----|----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 459 | | | 439 | | | 706 | | | 1206 | | |
| Exiting Flow Rate [veh/h] | 1038 | | | 899 | | | 459 | | | 176 | | |
| Demand Flow Rate [veh/h] | 5 | 472 | 170 | 170 | 641 | 58 | 297 | 101 | 180 | 170 | 85 | 16 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 508 | 183 | 183 | 689 | 62 | 319 | 109 | 194 | 183 | 91 | 17 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.99 | | | 0.99 | | | 0.98 | | | 1.00 | | |
| Entry Flow Rate [veh/h] | 707 | | | 943 | | | 633 | | | 291 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 865 | | | 882 | | | 672 | | | 404 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 852 | | | 874 | | | 661 | | | 404 | | |
| X, volume / capacity | 0.82 | | | 1.07 | | | 0.94 | | | 0.72 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | C | | | F | | | E | | | D | | |
| 95th-Percentile Queue Length [veh] | 9.12 | | | 22.88 | | | 13.05 | | | 5.57 | | |
| 95th-Percentile Queue Length [ft] | 228.09 | | | 572.06 | | | 326.15 | | | 139.18 | | |
| Approach Delay [s/veh] | 24.14 | | | 71.93 | | | 46.81 | | | 32.49 | | |
| Approach LOS | C | | | F | | | E | | | D | | |
| Intersection Delay [s/veh] | 48.19 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 9: Murphy Rd and Frontage Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 10.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|------------------------|-------------|--------|-----------|--------|-----------|--------|
| Approach | Northbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Thru | Right | Left | Thru |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | 30.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | Yes | | Yes | | Yes | |

Volumes

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|---|-------------|--------|-----------|--------|-----------|--------|
| Base Volume Input [veh/h] | 106 | 323 | 404 | 21 | 233 | 472 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 106 | 323 | 404 | 21 | 233 | 472 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 28 | 87 | 109 | 6 | 63 | 127 |
| Total Analysis Volume [veh/h] | 114 | 347 | 434 | 23 | 251 | 508 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

Intersection Settings

| | | | | | | |
|---|-----|-----|-----|----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | 1 | | 1 | |
| Circulating Flow Rate [veh/h] | 438 | | 254 | | 115 | |
| Exiting Flow Rate [veh/h] | 277 | | 628 | | 789 | |
| Demand Flow Rate [veh/h] | 106 | 323 | 404 | 21 | 233 | 472 |
| Adjusted Demand Flow Rate [veh/h] | 114 | 347 | 434 | 23 | 251 | 508 |

Lanes

| | | | | | | |
|--|---------|--|---------|--|---------|--|
| Override Calculated Critical Headway | No | | No | | No | |
| User-Defined Critical Headway [s] | 4.00 | | 4.00 | | 4.00 | |
| Override Calculated Follow-Up Time | No | | No | | No | |
| User-Defined Follow-Up Time [s] | 3.00 | | 3.00 | | 3.00 | |
| A (intercept) | 1380.00 | | 1380.00 | | 1380.00 | |
| B (coefficient) | 0.00102 | | 0.00102 | | 0.00102 | |
| HV Adjustment Factor | 0.99 | | 0.99 | | 0.99 | |
| Entry Flow Rate [veh/h] | 466 | | 462 | | 767 | |
| Capacity of Entry and Bypass Lanes [veh/h] | 883 | | 1066 | | 1228 | |
| Pedestrian Impedance | 1.00 | | 1.00 | | 1.00 | |
| Capacity per Entry Lane [veh/h] | 874 | | 1056 | | 1215 | |
| X, volume / capacity | 0.53 | | 0.43 | | 0.62 | |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|-------|--|-------|--|--------|--|
| Lane LOS | B | | A | | B | |
| 95th-Percentile Queue Length [veh] | 3.16 | | 2.23 | | 4.62 | |
| 95th-Percentile Queue Length [ft] | 78.94 | | 55.66 | | 115.49 | |
| Approach Delay [s/veh] | 11.26 | | 8.16 | | 10.88 | |
| Approach LOS | B | | A | | B | |
| Intersection Delay [s/veh] | | | 10.25 | | | |
| Intersection LOS | | | B | | | |

2040 30HV Powers Interchange and Existing Murphy HCM

HCM Signalized Intersection Capacity Analysis
 22: US 97 SB Ramp & Powers Rd

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|-------|--------|-------|-------|---------------------------|------|------|------|-------|------|------|
| Lane Configurations | | ↗ | | ↖ | ↖ | | | | | ↖ | ↗ | |
| Traffic Volume (vph) | 0 | 641 | 130 | 104 | 541 | 0 | 0 | 0 | 0 | 442 | 0 | 546 |
| Future Volume (vph) | 0 | 641 | 130 | 104 | 541 | 0 | 0 | 0 | 0 | 442 | 0 | 546 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | | 4.0 | | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Frbp, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Frt | | 0.98 | | 1.00 | 1.00 | | | | | 1.00 | 0.85 | |
| Flt Protected | | 1.00 | | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1702 | | 1662 | 1750 | | | | | 1662 | 1488 | |
| Flt Permitted | | 1.00 | | 0.11 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1702 | | 191 | 1750 | | | | | 1662 | 1488 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 0 | 675 | 137 | 109 | 569 | 0 | 0 | 0 | 0 | 465 | 0 | 575 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 221 | 0 |
| Lane Group Flow (vph) | 0 | 805 | 0 | 109 | 569 | 0 | 0 | 0 | 0 | 465 | 354 | 0 |
| Confl. Peds. (#/hr) | 6 | | | | | 6 | | | | | | |
| Heavy Vehicles (%) | 0% | 0% | 3% | 0% | 0% | 0% | 33% | 0% | 1% | 0% | 0% | 0% |
| Turn Type | | NA | | pm+pt | NA | | | | | Perm | NA | |
| Protected Phases | | 8 | | 7 | 4 | | | | | | 2 | |
| Permitted Phases | | | | 4 | | | | | | 2 | | |
| Actuated Green, G (s) | | 51.3 | | 60.7 | 60.7 | | | | | 29.3 | 29.3 | |
| Effective Green, g (s) | | 52.3 | | 61.7 | 61.7 | | | | | 30.3 | 30.3 | |
| Actuated g/C Ratio | | 0.52 | | 0.62 | 0.62 | | | | | 0.30 | 0.30 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 890 | | 197 | 1079 | | | | | 503 | 450 | |
| v/s Ratio Prot | | c0.47 | | 0.03 | c0.33 | | | | | | 0.24 | |
| v/s Ratio Perm | | | | 0.31 | | | | | | c0.28 | | |
| v/c Ratio | | 0.90 | | 0.55 | 0.53 | | | | | 0.92 | 0.79 | |
| Uniform Delay, d1 | | 21.6 | | 17.1 | 10.9 | | | | | 33.7 | 31.9 | |
| Progression Factor | | 1.00 | | 2.17 | 1.04 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 14.3 | | 0.8 | 0.5 | | | | | 22.8 | 8.8 | |
| Delay (s) | | 35.9 | | 38.0 | 11.8 | | | | | 56.6 | 40.7 | |
| Level of Service | | D | | D | B | | | | | E | D | |
| Approach Delay (s) | | 35.9 | | | 16.0 | | | 0.0 | | | 47.8 | |
| Approach LOS | | D | | | B | | | A | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 35.5 | | | HCM 2000 Level of Service | | | | D | | |
| HCM 2000 Volume to Capacity ratio | | | 0.90 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | Sum of lost time (s) | | | | 12.0 | | |
| Intersection Capacity Utilization | | | 114.6% | | | ICU Level of Service | | | | H | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: Powers Rd & US 97 NB Ramp

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | ↖ | ↑ | | | ↗ | | ↖ | ↗ | | | | |
| Traffic Volume (vph) | 280 | 803 | 0 | 0 | 587 | 344 | 58 | 0 | 468 | 0 | 0 | 0 |
| Future Volume (vph) | 280 | 803 | 0 | 0 | 587 | 344 | 58 | 0 | 468 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | | 4.0 | 4.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Frbp, ped/bikes | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | 0.95 | | 1.00 | 0.85 | | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (prot) | 1646 | 1733 | | | 1657 | | 1662 | 1488 | | | | |
| Flt Permitted | 0.07 | 1.00 | | | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (perm) | 119 | 1733 | | | 1657 | | 1662 | 1488 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 295 | 845 | 0 | 0 | 618 | 362 | 61 | 0 | 493 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 182 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 295 | 845 | 0 | 0 | 959 | 0 | 61 | 311 | 0 | 0 | 0 | 0 |
| Confl. Peds. (#/hr) | | | 1 | 1 | | | | | | | | |
| Confl. Bikes (#/hr) | | | 1 | | | | | | | | | |
| Heavy Vehicles (%) | 1% | 1% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | | | |
| Protected Phases | 3 | 8 | | | 4 | | | 6 | | | | |
| Permitted Phases | 8 | | | | | | 6 | | | | | |
| Actuated Green, G (s) | 70.0 | 70.0 | | | 53.0 | | 20.0 | 20.0 | | | | |
| Effective Green, g (s) | 71.0 | 71.0 | | | 54.0 | | 21.0 | 21.0 | | | | |
| Actuated g/C Ratio | 0.71 | 0.71 | | | 0.54 | | 0.21 | 0.21 | | | | |
| Clearance Time (s) | 5.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | | | | |
| Lane Grp Cap (vph) | 283 | 1230 | | | 894 | | 349 | 312 | | | | |
| v/s Ratio Prot | c0.14 | 0.49 | | | 0.58 | | | c0.21 | | | | |
| v/s Ratio Perm | c0.60 | | | | | | 0.04 | | | | | |
| v/c Ratio | 1.04 | 0.69 | | | 1.07 | | 0.17 | 1.00 | | | | |
| Uniform Delay, d1 | 34.3 | 8.2 | | | 23.0 | | 32.4 | 39.5 | | | | |
| Progression Factor | 0.86 | 1.04 | | | 1.00 | | 1.00 | 1.00 | | | | |
| Incremental Delay, d2 | 45.6 | 1.3 | | | 51.5 | | 0.2 | 50.0 | | | | |
| Delay (s) | 75.2 | 9.9 | | | 74.5 | | 32.6 | 89.5 | | | | |
| Level of Service | E | A | | | E | | C | F | | | | |
| Approach Delay (s) | | 26.8 | | | 74.5 | | | 83.2 | | | 0.0 | |
| Approach LOS | | C | | | E | | | F | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 56.0 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.06 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 114.6% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

54: Powers Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|-------|-------|------|------|-------|------|------|------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 310 | 321 | 640 | 37 | 151 | 37 | 506 | 477 | 21 | 16 | 800 | 274 |
| Future Volume (vph) | 310 | 321 | 640 | 37 | 151 | 37 | 506 | 477 | 21 | 16 | 800 | 274 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1662 | 1716 | 1488 | 1662 | 1693 | | 1646 | 3208 | | 1662 | 3129 | |
| Flt Permitted | 0.45 | 1.00 | 1.00 | 0.27 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 790 | 1716 | 1488 | 478 | 1693 | | 1646 | 3208 | | 1662 | 3129 | |
| Peak-hour factor, PHF | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 323 | 334 | 667 | 39 | 157 | 39 | 527 | 497 | 22 | 17 | 833 | 285 |
| RTOR Reduction (vph) | 0 | 0 | 46 | 0 | 9 | 0 | 0 | 2 | 0 | 0 | 32 | 0 |
| Lane Group Flow (vph) | 323 | 334 | 621 | 39 | 187 | 0 | 527 | 517 | 0 | 17 | 1086 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | | 1 | 3 | | 1 | 1 | 3 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 0% | 0% | 0% | 1% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | pm+pt | NA | pm+ov | pm+pt | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 3 | 8 | 1 | 7 | 4 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 8 | | 8 | 4 | | | | | | | | |
| Actuated Green, G (s) | 30.8 | 26.8 | 61.2 | 27.6 | 25.2 | | 34.4 | 59.0 | | 2.6 | 27.2 | |
| Effective Green, g (s) | 30.8 | 26.8 | 61.2 | 27.6 | 25.2 | | 34.4 | 60.2 | | 2.6 | 28.4 | |
| Actuated g/C Ratio | 0.29 | 0.25 | 0.57 | 0.26 | 0.23 | | 0.32 | 0.56 | | 0.02 | 0.26 | |
| Clearance Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 5.2 | | 4.0 | 5.2 | |
| Vehicle Extension (s) | 3.0 | 3.5 | 2.5 | 3.0 | 3.5 | | 2.5 | 5.2 | | 2.5 | 5.2 | |
| Lane Grp Cap (vph) | 257 | 425 | 898 | 148 | 395 | | 524 | 1788 | | 40 | 822 | |
| v/s Ratio Prot | c0.05 | 0.19 | c0.22 | 0.01 | 0.11 | | c0.32 | 0.16 | | 0.01 | c0.35 | |
| v/s Ratio Perm | c0.31 | | 0.20 | 0.06 | | | | | | | | |
| v/c Ratio | 1.26 | 0.79 | 0.69 | 0.26 | 0.47 | | 1.01 | 0.29 | | 0.42 | 1.32 | |
| Uniform Delay, d1 | 39.8 | 37.9 | 16.7 | 31.4 | 35.7 | | 36.8 | 12.6 | | 52.0 | 39.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 143.2 | 9.5 | 2.1 | 1.0 | 1.1 | | 40.7 | 0.4 | | 5.2 | 153.2 | |
| Delay (s) | 183.0 | 47.4 | 18.8 | 32.4 | 36.7 | | 77.5 | 13.0 | | 57.2 | 193.0 | |
| Level of Service | F | D | B | C | D | | E | B | | E | F | |
| Approach Delay (s) | | 66.1 | | | 36.0 | | | 45.5 | | | 191.0 | |
| Approach LOS | | E | | | D | | | D | | | F | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 96.3 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.21 | | |
| Actuated Cycle Length (s) | 108.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 107.7% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

57: Badger Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations | ↖ | ↗ | | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↗ | |
| Traffic Volume (vph) | 74 | 16 | 21 | 64 | 21 | 32 | 21 | 763 | 37 | 32 | 1240 | 101 |
| Future Volume (vph) | 74 | 16 | 21 | 64 | 21 | 32 | 21 | 763 | 37 | 32 | 1240 | 101 |
| Ideal Flow (vphp) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 0.99 | | | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1629 | 1590 | | | 1643 | 1469 | 1498 | 3206 | | 1662 | 3222 | |
| Flt Permitted | 0.68 | 1.00 | | | 0.75 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1160 | 1590 | | | 1282 | 1469 | 1498 | 3206 | | 1662 | 3222 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 82 | 18 | 23 | 71 | 23 | 36 | 23 | 848 | 41 | 36 | 1378 | 112 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 0 | 31 | 0 | 2 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 82 | 21 | 0 | 0 | 94 | 5 | 23 | 887 | 0 | 36 | 1487 | 0 |
| Confl. Peds. (#/hr) | 1 | | 2 | 2 | | 1 | 1 | | 3 | 3 | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 0% | 2% | 4% | 0% | 11% | 3% | 0% | 0% | 2% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | |
| Actuated Green, G (s) | 11.0 | 11.0 | | | 11.0 | 11.0 | 3.7 | 59.8 | | 4.8 | 60.9 | |
| Effective Green, g (s) | 11.5 | 11.5 | | | 11.5 | 11.5 | 4.2 | 61.2 | | 5.3 | 62.3 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | | 0.13 | 0.13 | 0.05 | 0.68 | | 0.06 | 0.69 | |
| Clearance Time (s) | 4.5 | 4.5 | | | 4.5 | 4.5 | 4.5 | 5.4 | | 4.5 | 5.4 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.2 | | 2.5 | 4.7 | |
| Lane Grp Cap (vph) | 148 | 203 | | | 163 | 187 | 69 | 2180 | | 97 | 2230 | |
| v/s Ratio Prot | | 0.01 | | | | | 0.02 | 0.28 | | c0.02 | c0.46 | |
| v/s Ratio Perm | 0.07 | | | | c0.07 | 0.00 | | | | | | |
| v/c Ratio | 0.55 | 0.10 | | | 0.58 | 0.02 | 0.33 | 0.41 | | 0.37 | 0.67 | |
| Uniform Delay, d1 | 36.8 | 34.7 | | | 37.0 | 34.3 | 41.5 | 6.4 | | 40.7 | 7.9 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.4 | 0.3 | | | 5.8 | 0.1 | 3.9 | 0.6 | | 1.7 | 1.6 | |
| Delay (s) | 42.3 | 35.0 | | | 42.8 | 34.4 | 45.4 | 6.9 | | 42.5 | 9.5 | |
| Level of Service | D | C | | | D | C | D | A | | D | A | |
| Approach Delay (s) | | 39.9 | | | 40.5 | | | 7.9 | | | 10.3 | |
| Approach LOS | | D | | | D | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 12.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 59.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM 6th TWSC
 27: US 97 & Ponderosa St/China Hat Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 76.2 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | | ↗ | | | ↗ | | ↕ | ↗ | | ↕ | ↗ |
| Traffic Vol, veh/h | 0 | 0 | 39 | 0 | 0 | 753 | 0 | 1157 | 58 | 0 | 2274 | 155 |
| Future Vol, veh/h | 0 | 0 | 39 | 0 | 0 | 753 | 0 | 1157 | 58 | 0 | 2274 | 155 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | 0 | - | - | 0 | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 42 | 0 | 0 | 818 | 0 | 1258 | 63 | 0 | 2472 | 168 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|---|--------|---|--------|-------|--------|---|---|---|---|---|
| Conflicting Flow All | - | - | 1236 | - | - | 629 | - | 0 | 0 | - | - | 0 |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy | - | - | 6.94 | - | - | 6.94 | - | - | - | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | 3.32 | - | - | 3.32 | - | - | - | - | - | - |
| Pot Cap-1 Maneuver | 0 | 0 | 168 | 0 | 0 | ~ 425 | 0 | - | - | 0 | - | - |
| Stage 1 | 0 | 0 | - | 0 | 0 | - | 0 | - | - | 0 | - | - |
| Stage 2 | 0 | 0 | - | 0 | 0 | - | 0 | - | - | 0 | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | - | - | 168 | - | - | ~ 425 | - | - | - | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|------|--|--------|--|----|--|----|--|
| HCM Control Delay, s | 33.5 | | \$ 447 | | 0 | | 0 | |
| HCM LOS | D | | F | | | | | |

| Minor Lane/Major Mvmt | NBT | NBR | EBLn1WBLn1 | SBT | SBR |
|-----------------------|-----|-----|-------------|-----|-----|
| Capacity (veh/h) | - | - | 168 425 | - | - |
| HCM Lane V/C Ratio | - | - | 0.252 1.926 | - | - |
| HCM Control Delay (s) | - | - | 33.5 \$ 447 | - | - |
| HCM Lane LOS | - | - | D F | - | - |
| HCM 95th %tile Q(veh) | - | - | 1 54.8 | - | - |

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

HCM 6th TWSC
55: Powers Rd & Parrell Rd

09/30/2019

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 10 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 191 | 138 | 69 | 201 | 382 | 148 |
| Future Vol, veh/h | 191 | 138 | 69 | 201 | 382 | 148 |
| Conflicting Peds, #/hr | 1 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 3 | 4 | 3 | 3 | 5 | 2 |
| Mvmt Flow | 212 | 153 | 77 | 223 | 424 | 164 |

| Major/Minor | Minor2 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 884 | 506 | 588 | 0 | - | 0 |
| Stage 1 | 506 | - | - | - | - | - |
| Stage 2 | 378 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.24 | 4.13 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.336 | 2.227 | - | - | - |
| Pot Cap-1 Maneuver | 315 | 562 | 982 | - | - | - |
| Stage 1 | 603 | - | - | - | - | - |
| Stage 2 | 691 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 287 | 562 | 982 | - | - | - |
| Mov Cap-2 Maneuver | 287 | - | - | - | - | - |
| Stage 1 | 549 | - | - | - | - | - |
| Stage 2 | 691 | - | - | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 32.6 | 2.3 | 0 |
| HCM LOS | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|-----------------------|-------|-----|-------|-------|-----|-----|
| Capacity (veh/h) | 982 | - | 287 | 562 | - | - |
| HCM Lane V/C Ratio | 0.078 | - | 0.739 | 0.273 | - | - |
| HCM Control Delay (s) | 9 | 0 | 46.2 | 13.8 | - | - |
| HCM Lane LOS | A | A | E | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 5.4 | 1.1 | - | - |

HCM 6th TWSC
58: SE 3rd St & Pinebrook Blvd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 3 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Vol, veh/h | 16 | 0 | 42 | 5 | 0 | 32 | 53 | 716 | 11 | 58 | 1118 | 74 |
| Future Vol, veh/h | 16 | 0 | 42 | 5 | 0 | 32 | 53 | 716 | 11 | 58 | 1118 | 74 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 1 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 110 | - | 115 | 15 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 17 | 2 | 2 | 0 |
| Mvmt Flow | 17 | 0 | 45 | 5 | 0 | 34 | 57 | 770 | 12 | 62 | 1202 | 80 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|------|--------|------|--------|------|--------|---|---|------|---|---|
| Conflicting Flow All | 1866 | 2267 | 642 | 1619 | 2301 | 395 | 1283 | 0 | 0 | 786 | 0 | 0 |
| Stage 1 | 1367 | 1367 | - | 894 | 894 | - | - | - | - | - | - | - |
| Stage 2 | 499 | 900 | - | 725 | 1407 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.96 | 4.12 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.5 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.5 | 4 | 3.33 | 2.21 | - | - | 2.22 | - | - |
| Pot Cap-1 Maneuver | 46 | 41 | 422 | 70 | 39 | 601 | 542 | - | - | 829 | - | - |
| Stage 1 | 158 | 217 | - | 306 | 362 | - | - | - | - | - | - | - |
| Stage 2 | 527 | 360 | - | 387 | 207 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | - | - | - |
| Mov Cap-1 Maneuver | 38 | 34 | 422 | 54 | 32 | 599 | 542 | - | - | 826 | - | - |
| Mov Cap-2 Maneuver | 38 | 34 | - | 54 | 32 | - | - | - | - | - | - | - |
| Stage 1 | 141 | 201 | - | 273 | 323 | - | - | - | - | - | - | - |
| Stage 2 | 444 | 321 | - | 320 | 191 | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 72.7 | | 21.9 | | 0.8 | | 0.5 | |
| HCM LOS | F | | C | | | | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1WBLn1 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|------------|-------|-------|-----|
| Capacity (veh/h) | 542 | - | - | 111 | 253 | 826 | - |
| HCM Lane V/C Ratio | 0.105 | - | - | 0.562 | 0.157 | 0.076 | - |
| HCM Control Delay (s) | 12.4 | - | - | 72.7 | 21.9 | 9.7 | - |
| HCM Lane LOS | B | - | - | F | C | A | - |
| HCM 95th %tile Q(veh) | 0.4 | - | - | 2.7 | 0.5 | 0.2 | - |

HCM 6th TWSC
60: China Hat Rd & Parrell Road

09/30/2019

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 6.1 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ↙ | ↑ | ↘ | | | ↗ |
| Traffic Vol, veh/h | 5 | 53 | 663 | 122 | 350 | 90 |
| Future Vol, veh/h | 5 | 53 | 663 | 122 | 350 | 90 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 300 | - | - | - | - | 0 |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 1 | 0 | 3 | 0 |
| Mvmt Flow | 6 | 59 | 737 | 136 | 389 | 100 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|---|-----------|
| Conflicting Flow All | 873 | 0 | - | 0 | 876 805 |
| Stage 1 | - | - | - | - | 805 - |
| Stage 2 | - | - | - | - | 71 - |
| Critical Hdwy | 4.1 | - | - | - | 6.43 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.527 3.3 |
| Pot Cap-1 Maneuver | 781 | - | - | - | ~ 318 386 |
| Stage 1 | - | - | - | - | 438 - |
| Stage 2 | - | - | - | - | 949 - |
| Platoon blocked, % | | - | - | - | |
| Mov Cap-1 Maneuver | 781 | - | - | - | ~ 315 386 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 315 - |
| Stage 1 | - | - | - | - | 434 - |
| Stage 2 | - | - | - | - | 949 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.8 | 0 | 17.6 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 781 | - | - | - | 386 |
| HCM Lane V/C Ratio | 0.007 | - | - | - | 0.259 |
| HCM Control Delay (s) | 9.6 | - | - | - | 17.6 |
| HCM Lane LOS | A | - | - | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 1 |

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

HCM 6th TWSC
62: Powers Rd & Blakely Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 47 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 11 | 635 | 64 | 163 | 825 | 99 | 16 | 5 | 110 | 26 | 5 | 48 |
| Future Vol, veh/h | 11 | 635 | 64 | 163 | 825 | 99 | 16 | 5 | 110 | 26 | 5 | 48 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 25 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 12 | 676 | 68 | 173 | 878 | 105 | 17 | 5 | 117 | 28 | 5 | 51 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|------|-----|--------|------|-----|
| Conflicting Flow All | 986 | 0 | 0 | 744 | 0 | 0 | 2041 | 2066 | 710 | 2075 | 2048 | 936 |
| Stage 1 | - | - | - | - | - | - | 734 | 734 | - | 1280 | 1280 | - |
| Stage 2 | - | - | - | - | - | - | 1307 | 1332 | - | 795 | 768 | - |
| Critical Hdwy | 4.35 | - | - | 4.1 | - | - | 7.16 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.16 | 5.5 | - | 6.1 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.16 | 5.5 | - | 6.1 | 5.5 | - |
| Follow-up Hdwy | 2.425 | - | - | 2.2 | - | - | 3.554 | 4 | 3.3 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 617 | - | - | 873 | - | - | 41 | 55 | 437 | 40 | 57 | 324 |
| Stage 1 | - | - | - | - | - | - | 406 | 429 | - | 206 | 239 | - |
| Stage 2 | - | - | - | - | - | - | 193 | 225 | - | 384 | 414 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 615 | - | - | 873 | - | - | 19 | 29 | 437 | ~ 16 | 30 | 323 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 19 | 29 | - | ~ 16 | 30 | - |
| Stage 1 | - | - | - | - | - | - | 392 | 414 | - | 199 | 132 | - |
| Stage 2 | - | - | - | - | - | - | 86 | 124 | - | 268 | 400 | - |

| Approach | EB | | | WB | | | NB | | | SB | | |
|----------------------|-----|--|--|-----|--|--|-------|--|--|----------|--|--|
| HCM Control Delay, s | 0.2 | | | 1.5 | | | 285.5 | | | \$ 698.9 | | |
| HCM LOS | | | | | | | F | | | F | | |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|----------|
| Capacity (veh/h) | 103 | 615 | - | - | 873 | - | - | 41 |
| HCM Lane V/C Ratio | 1.353 | 0.019 | - | - | 0.199 | - | - | 2.05 |
| HCM Control Delay (s) | 285.5 | 11 | 0 | - | 10.1 | 0 | - | \$ 698.9 |
| HCM Lane LOS | F | B | A | - | B | A | - | F |
| HCM 95th %tile Q(veh) | 9.9 | 0.1 | - | - | 0.7 | - | - | 8.9 |

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

HCM 6th TWSC
 155: Murphy Road & Old Murphy Road

09/30/2019

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 173 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ↶ | ↷ | | ↶ | |
| Traffic Vol, veh/h | 11 | 584 | 549 | 143 | 387 | 53 |
| Future Vol, veh/h | 11 | 584 | 549 | 143 | 387 | 53 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 0 | 2 | 1 | 1 | 3 | 0 |
| Mvmt Flow | 11 | 608 | 572 | 149 | 403 | 55 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|---|-----------|
| Conflicting Flow All | 724 | 0 | - | 0 | 1280 650 |
| Stage 1 | - | - | - | - | 650 - |
| Stage 2 | - | - | - | - | 630 - |
| Critical Hdwy | 4.1 | - | - | - | 6.43 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.527 3.3 |
| Pot Cap-1 Maneuver | 888 | - | - | - | ~ 182 473 |
| Stage 1 | - | - | - | - | 518 - |
| Stage 2 | - | - | - | - | 529 - |
| Platoon blocked, % | | - | - | - | |
| Mov Cap-1 Maneuver | 886 | - | - | - | ~ 178 472 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 178 - |
| Stage 1 | - | - | - | - | 507 - |
| Stage 2 | - | - | - | - | 528 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|----------|
| HCM Control Delay, s | 0.2 | 0 | \$ 678.7 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|----------|
| Capacity (veh/h) | 886 | - | - | - | 192 |
| HCM Lane V/C Ratio | 0.013 | - | - | - | 2.387 |
| HCM Control Delay (s) | 9.1 | 0 | - | - | \$ 678.7 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 37.8 |

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

Bend Pkwy Powers OC Murphy Frontage

Vistro File:

X:\...\Roundabouts_PowersInterchange_MurphyExisting.vistr

o

Report File: X:\...\PowersInterchange_MurphyExisting.pdf

Scenario: Base Scenario

9/29/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|----|------------------------------|--------------|-----------------|------------|-----|---------------|-----|
| 2 | Powers Rd and Brookwood Blvd | Roundabout | HCM 6th Edition | SB Thru | | 205.9 | F |
| 3 | Murphy Rd and 3rd St | Roundabout | HCM 6th Edition | EB Left | | 80.8 | F |
| 5 | Parrell Rd and Murphy Rd | Roundabout | HCM 6th Edition | EB Thru | | 73.6 | F |
| 8 | Brookwood Blvd and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 21.2 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Powers Rd and Brookwood Blvd

| | | | |
|------------------|-----------------|--------------------|-------|
| Control Type: | Roundabout | Delay (sec / veh): | 205.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | + | | | + | | | + | | | + | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 5 | 398 | 199 | 435 | 588 | 42 | 42 | 76 | 5 | 575 | 93 | 221 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 398 | 199 | 435 | 588 | 42 | 42 | 76 | 5 | 575 | 93 | 221 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 108 | 54 | 118 | 160 | 11 | 11 | 21 | 1 | 156 | 25 | 60 |
| Total Analysis Volume [veh/h] | 5 | 433 | 216 | 473 | 639 | 46 | 46 | 83 | 5 | 625 | 101 | 240 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|----|------|----|---|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 614 | | | 746 | | | 1772 | | | 494 | | |
| Exiting Flow Rate [veh/h] | 1294 | | | 733 | | | 155 | | | 787 | | |
| Demand Flow Rate [veh/h] | 5 | 398 | 199 | 435 | 588 | 42 | 42 | 76 | 5 | 575 | 93 | 221 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 433 | 216 | 473 | 639 | 46 | 46 | 83 | 5 | 625 | 101 | 240 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 668 | | | 1182 | | | 137 | | | 986 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 738 | | | 646 | | | 227 | | | 835 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 724 | | | 633 | | | 223 | | | 818 | | |
| X, volume / capacity | 0.90 | | | 1.83 | | | 0.60 | | | 1.18 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|---------|--|--|-------|--|--|--------|--|--|
| Lane LOS | E | | | F | | | E | | | F | | |
| 95th-Percentile Queue Length [veh] | 11.92 | | | 71.75 | | | 3.47 | | | 30.44 | | |
| 95th-Percentile Queue Length [ft] | 298.02 | | | 1793.84 | | | 86.78 | | | 760.99 | | |
| Approach Delay [s/veh] | 37.86 | | | 396.86 | | | 41.20 | | | 113.51 | | |
| Approach LOS | E | | | F | | | E | | | F | | |
| Intersection Delay [s/veh] | 205.87 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 3: Murphy Rd and 3rd St**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 80.8
 Level Of Service: F

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | + | | | + | | | + | | | + | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 150.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 130 | 318 | 65 | 249 | 474 | 180 | 344 | 281 | 13 | 162 | 281 | 159 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 3.00 | 11.00 | 2.00 | 2.00 | 0.00 | 2.00 | 1.00 | 0.00 | 3.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 130 | 318 | 65 | 249 | 474 | 180 | 344 | 281 | 13 | 162 | 281 | 159 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 85 | 17 | 67 | 127 | 48 | 92 | 76 | 3 | 44 | 76 | 43 |
| Total Analysis Volume [veh/h] | 140 | 342 | 70 | 268 | 510 | 194 | 370 | 302 | 14 | 174 | 302 | 171 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 956 | | | 624 | | | 973 | | | 870 | | |
| Exiting Flow Rate [veh/h] | 713 | | | 902 | | | 639 | | | 656 | | |
| Demand Flow Rate [veh/h] | 130 | 318 | 65 | 249 | 474 | 180 | 344 | 281 | 13 | 162 | 281 | 159 |
| Adjusted Demand Flow Rate [veh/h] | 140 | 342 | 70 | 268 | 510 | 194 | 370 | 302 | 14 | 174 | 302 | 171 |

Lanes

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Override Calculated Critical Headway | No | No | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Override Calculated Follow-Up Time | No | No | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1420.00 | 1420.00 | 1420.00 | 1420.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00102 |
| HV Adjustment Factor | 0.97 | 0.98 | 0.99 | 0.98 | 1.00 | 0.98 |
| Entry Flow Rate [veh/h] | 570 | 274 | 715 | 683 | 14 | 657 |
| Capacity of Entry and Bypass Lanes [veh/h] | 521 | 805 | 805 | 586 | 586 | 569 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 505 | 789 | 794 | 577 | 586 | 560 |
| X, volume / capacity | 1.09 | 0.34 | 0.89 | 1.16 | 0.02 | 1.16 |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|-------|--------|--------|------|--------|
| Lane LOS | F | A | D | F | A | F |
| 95th-Percentile Queue Length [veh] | 17.65 | 1.51 | 11.60 | 22.89 | 0.07 | 21.95 |
| 95th-Percentile Queue Length [ft] | 441.21 | 37.72 | 290.10 | 572.18 | 1.83 | 548.79 |
| Approach Delay [s/veh] | 96.15 | 26.42 | | 114.18 | | 114.10 |
| Approach LOS | F | D | | F | | F |
| Intersection Delay [s/veh] | 80.82 | | | | | |
| Intersection LOS | F | | | | | |

**Intersection Level Of Service Report
Intersection 5: Parrell Rd and Murphy Rd**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 73.6
 Level Of Service: F

Intersection Setup

| Name | Parrell Road | | | | | | | | | | | |
|------------------------|--------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Parrell Road | | | | | | | | | | | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 133 | 53 | 53 | 223 | 186 | 78 | 64 | 563 | 344 | 85 | 481 | 101 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 0.00 | 0.00 | 3.00 | 1.00 | 3.00 | 4.00 | 2.00 | 1.00 | 3.00 | 2.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 133 | 53 | 53 | 223 | 186 | 78 | 64 | 563 | 344 | 85 | 481 | 101 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 14 | 14 | 58 | 48 | 20 | 17 | 147 | 90 | 22 | 125 | 26 |
| Total Analysis Volume [veh/h] | 139 | 55 | 55 | 232 | 194 | 81 | 67 | 586 | 358 | 89 | 501 | 105 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|----|----|-----|-----|----|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 906 | | | 742 | | | 527 | | | 264 | | |
| Exiting Flow Rate [veh/h] | 649 | | | 231 | | | 733 | | | 892 | | |
| Demand Flow Rate [veh/h] | 133 | 53 | 53 | 223 | 186 | 78 | 64 | 563 | 344 | 85 | 481 | 101 |
| Adjusted Demand Flow Rate [veh/h] | 139 | 55 | 55 | 232 | 194 | 81 | 67 | 586 | 358 | 89 | 501 | 105 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 1.00 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 249 | | | 519 | | | 1029 | | | 709 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 548 | | | 648 | | | 807 | | | 1055 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 548 | | | 634 | | | 793 | | | 1035 | | |
| X, volume / capacity | 0.45 | | | 0.80 | | | 1.28 | | | 0.67 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|-------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | B | | | D | | | F | | | B | | |
| 95th-Percentile Queue Length [veh] | 2.35 | | | 7.99 | | | 37.44 | | | 5.45 | | |
| 95th-Percentile Queue Length [ft] | 58.85 | | | 199.69 | | | 936.01 | | | 136.19 | | |
| Approach Delay [s/veh] | 14.22 | | | 28.51 | | | 151.94 | | | 13.66 | | |
| Approach LOS | B | | | D | | | F | | | B | | |
| Intersection Delay [s/veh] | 73.56 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

Intersection Level Of Service Report
Intersection 8: Brookwood Blvd and Murphy Rd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 21.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|------------------------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Approach | Northeastbound | | | Southwestbound | | | Northwestbound | | | Southeastbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|---|----------------|--------|--------|-----------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 5 | 376 | 260 | 175 | 530 | 64 | 286 | 58 | 217 | 53 | 53 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 2.00 | 0.00 | 1.00 | 1.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 376 | 260 | 175 | 530 | 64 | 286 | 58 | 217 | 53 | 53 | 26 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 101 | 70 | 47 | 142 | 17 | 77 | 16 | 58 | 14 | 14 | 7 |
| Total Analysis Volume [veh/h] | 5 | 404 | 280 | 188 | 570 | 69 | 308 | 62 | 233 | 57 | 57 | 28 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|----|-----|----|-----|------|----|----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 304 | | | 381 | | | 474 | | | 1080 | | |
| Exiting Flow Rate [veh/h] | 918 | | | 707 | | | 527 | | | 136 | | |
| Demand Flow Rate [veh/h] | 5 | 376 | 260 | 175 | 530 | 64 | 286 | 58 | 217 | 53 | 53 | 26 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 404 | 280 | 188 | 570 | 69 | 308 | 62 | 233 | 57 | 57 | 28 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.99 | | | 0.99 | | | 0.98 | | | 1.00 | | |
| Entry Flow Rate [veh/h] | 698 | | | 835 | | | 614 | | | 142 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 1013 | | | 936 | | | 851 | | | 459 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 1001 | | | 927 | | | 836 | | | 459 | | |
| X, volume / capacity | 0.69 | | | 0.89 | | | 0.72 | | | 0.31 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|-------|--|--|
| Lane LOS | B | | | D | | | C | | | B | | |
| 95th-Percentile Queue Length [veh] | 5.78 | | | 12.44 | | | 6.37 | | | 1.30 | | |
| 95th-Percentile Queue Length [ft] | 144.43 | | | 310.93 | | | 159.30 | | | 32.55 | | |
| Approach Delay [s/veh] | 14.59 | | | 30.42 | | | 18.22 | | | 12.87 | | |
| Approach LOS | B | | | D | | | C | | | B | | |
| Intersection Delay [s/veh] | 21.24 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |

2040 30HV Powers Overcrossing and Murphy Diamond HCM

HCM Signalized Intersection Capacity Analysis

54: Powers Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|------|----------------------|---------------------------|------|------|------|-------|------|
| Lane Configurations | ↖ | ↑ | ↗ | ↖ | ↗ | | ↖ | ↑↗ | | ↖ | ↑↗ | |
| Traffic Volume (vph) | 318 | 193 | 212 | 21 | 58 | 80 | 101 | 615 | 20 | 20 | 1161 | 313 |
| Future Volume (vph) | 318 | 193 | 212 | 21 | 58 | 80 | 101 | 615 | 20 | 20 | 1161 | 313 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1630 | 1733 | 1467 | 1612 | 1582 | | 1662 | 3205 | | 1630 | 3152 | |
| Flt Permitted | 0.62 | 1.00 | 1.00 | 0.54 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1072 | 1733 | 1467 | 918 | 1582 | | 1662 | 3205 | | 1630 | 3152 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 342 | 208 | 228 | 23 | 62 | 86 | 109 | 661 | 22 | 22 | 1248 | 337 |
| RTOR Reduction (vph) | 0 | 0 | 82 | 0 | 52 | 0 | 0 | 2 | 0 | 0 | 24 | 0 |
| Lane Group Flow (vph) | 342 | 208 | 146 | 23 | 96 | 0 | 109 | 681 | 0 | 22 | 1561 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 2 | | | | | 2 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 3% | 1% | 1% | 0% | 3% | 11% | 2% | 2% | 0% |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 8 | | | 4 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 8 | | 8 | 4 | | | | | | | | |
| Actuated Green, G (s) | 33.7 | 33.7 | 33.7 | 33.7 | 33.7 | | 7.3 | 51.1 | | 2.0 | 45.8 | |
| Effective Green, g (s) | 33.7 | 33.7 | 33.7 | 33.7 | 33.7 | | 7.3 | 52.3 | | 2.0 | 47.0 | |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | | 0.07 | 0.52 | | 0.02 | 0.47 | |
| Clearance Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 5.2 | | 4.0 | 5.2 | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 2.5 | 5.2 | | 2.5 | 5.2 | |
| Lane Grp Cap (vph) | 361 | 584 | 494 | 309 | 533 | | 121 | 1676 | | 32 | 1481 | |
| v/s Ratio Prot | | 0.12 | | | 0.06 | | c0.07 | 0.21 | | 0.01 | c0.50 | |
| v/s Ratio Perm | c0.32 | | 0.10 | 0.03 | | | | | | | | |
| v/c Ratio | 0.95 | 0.36 | 0.30 | 0.07 | 0.18 | | 0.90 | 0.41 | | 0.69 | 1.05 | |
| Uniform Delay, d1 | 32.3 | 25.0 | 24.4 | 22.5 | 23.4 | | 46.0 | 14.4 | | 48.7 | 26.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 33.8 | 0.4 | 0.4 | 0.1 | 0.2 | | 52.3 | 0.7 | | 43.8 | 39.0 | |
| Delay (s) | 66.1 | 25.4 | 24.8 | 22.7 | 23.6 | | 98.3 | 15.2 | | 92.5 | 65.5 | |
| Level of Service | E | C | C | C | C | | F | B | | F | E | |
| Approach Delay (s) | | 43.1 | | | 23.5 | | | 26.6 | | | 65.8 | |
| Approach LOS | | D | | | C | | | C | | | E | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 49.1 | | | | HCM 2000 Level of Service | | | D | | |
| HCM 2000 Volume to Capacity ratio | | | 1.00 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 100.0 | | | Sum of lost time (s) | | | 12.0 | | | |
| Intersection Capacity Utilization | | | 92.9% | | | ICU Level of Service | | | F | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

57: Badger Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 16 | 21 | 74 | 27 | 32 | 21 | 493 | 37 | 32 | 1055 | 95 |
| Future Volume (vph) | 74 | 16 | 21 | 74 | 27 | 32 | 21 | 493 | 37 | 32 | 1055 | 95 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.91 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1662 | 1599 | | | 1688 | 1488 | 1662 | 3288 | | 1662 | 3277 | |
| Flt Permitted | 0.62 | 1.00 | | | 0.76 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1089 | 1599 | | | 1326 | 1488 | 1662 | 3288 | | 1662 | 3277 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 80 | 17 | 23 | 80 | 29 | 35 | 23 | 536 | 40 | 35 | 1147 | 103 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 0 | 31 | 0 | 3 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 80 | 20 | 0 | 0 | 109 | 4 | 23 | 573 | 0 | 35 | 1247 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 2 | | | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | |
| Actuated Green, G (s) | 10.9 | 10.9 | | | 10.9 | 10.9 | 3.6 | 60.0 | | 4.7 | 61.1 | |
| Effective Green, g (s) | 11.4 | 11.4 | | | 11.4 | 11.4 | 4.1 | 61.4 | | 5.2 | 62.5 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | | 0.13 | 0.13 | 0.05 | 0.68 | | 0.06 | 0.69 | |
| Clearance Time (s) | 4.5 | 4.5 | | | 4.5 | 4.5 | 4.5 | 5.4 | | 4.5 | 5.4 | |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.2 | | 2.5 | 4.7 | |
| Lane Grp Cap (vph) | 137 | 202 | | | 167 | 188 | 75 | 2243 | | 96 | 2275 | |
| v/s Ratio Prot | | 0.01 | | | | | 0.01 | 0.17 | | c0.02 | c0.38 | |
| v/s Ratio Perm | 0.07 | | | | c0.08 | 0.00 | | | | | | |
| v/c Ratio | 0.58 | 0.10 | | | 0.65 | 0.02 | 0.31 | 0.26 | | 0.36 | 0.55 | |
| Uniform Delay, d1 | 37.1 | 34.8 | | | 37.4 | 34.4 | 41.6 | 5.5 | | 40.8 | 6.8 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 7.3 | 0.3 | | | 9.7 | 0.1 | 3.2 | 0.3 | | 1.7 | 1.0 | |
| Delay (s) | 44.4 | 35.0 | | | 47.1 | 34.5 | 44.7 | 5.8 | | 42.5 | 7.7 | |
| Level of Service | D | D | | | D | C | D | A | | D | A | |
| Approach Delay (s) | | 41.3 | | | 44.1 | | | 7.3 | | | 8.7 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 12.5 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.56 | B |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) |
| Intersection Capacity Utilization | 54.3% | 12.0 |
| Analysis Period (min) | 15 | ICU Level of Service |
| | | A |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 153: US 97 SB Ramp & Murphy Rd

10/02/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|---------------------------|------|------|------|-------|------|------|
| Lane Configurations | | ↗ | | ↖ | ↖ | | | | | ↖ | | ↖ |
| Traffic Volume (vph) | 0 | 387 | 104 | 390 | 212 | 0 | 0 | 0 | 0 | 319 | 0 | 429 |
| Future Volume (vph) | 0 | 387 | 104 | 390 | 212 | 0 | 0 | 0 | 0 | 319 | 0 | 429 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | | 4.0 | | 4.0 | 4.0 | | | | | 4.0 | | 4.0 |
| Lane Util. Factor | | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | | 1.00 |
| Frt | | 0.97 | | 1.00 | 1.00 | | | | | 1.00 | | 0.85 |
| Flt Protected | | 1.00 | | 0.95 | 1.00 | | | | | 0.95 | | 1.00 |
| Satd. Flow (prot) | | 1683 | | 1646 | 1733 | | | | | 1646 | | 1473 |
| Flt Permitted | | 1.00 | | 0.17 | 1.00 | | | | | 0.95 | | 1.00 |
| Satd. Flow (perm) | | 1683 | | 290 | 1733 | | | | | 1646 | | 1473 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 416 | 112 | 419 | 228 | 0 | 0 | 0 | 0 | 343 | 0 | 461 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 342 |
| Lane Group Flow (vph) | 0 | 512 | 0 | 419 | 228 | 0 | 0 | 0 | 0 | 343 | 0 | 119 |
| Heavy Vehicles (%) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Turn Type | | NA | | pm+pt | NA | | | | | Perm | | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | | | | | |
| Permitted Phases | | | | 8 | | | | | | 6 | | 6 |
| Actuated Green, G (s) | | 18.9 | | 35.5 | 35.5 | | | | | 14.5 | | 14.5 |
| Effective Green, g (s) | | 19.9 | | 36.5 | 36.5 | | | | | 15.5 | | 15.5 |
| Actuated g/C Ratio | | 0.33 | | 0.61 | 0.61 | | | | | 0.26 | | 0.26 |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | 5.0 | | 5.0 |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | | 3.0 |
| Lane Grp Cap (vph) | | 558 | | 461 | 1054 | | | | | 425 | | 380 |
| v/s Ratio Prot | | 0.30 | | c0.19 | 0.13 | | | | | | | |
| v/s Ratio Perm | | | | c0.36 | | | | | | c0.21 | | 0.08 |
| v/c Ratio | | 0.92 | | 0.91 | 0.22 | | | | | 0.81 | | 0.31 |
| Uniform Delay, d1 | | 19.3 | | 14.0 | 5.3 | | | | | 20.8 | | 18.0 |
| Progression Factor | | 1.00 | | 1.49 | 0.99 | | | | | 1.00 | | 1.00 |
| Incremental Delay, d2 | | 22.4 | | 18.8 | 0.4 | | | | | 10.7 | | 0.5 |
| Delay (s) | | 41.6 | | 39.7 | 5.6 | | | | | 31.6 | | 18.4 |
| Level of Service | | D | | D | A | | | | | C | | B |
| Approach Delay (s) | | 41.6 | | | 27.7 | | | 0.0 | | | 24.0 | |
| Approach LOS | | D | | | C | | | A | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 29.9 | | | HCM 2000 Level of Service | | | | C | | |
| HCM 2000 Volume to Capacity ratio | | | 0.95 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 60.0 | | | Sum of lost time (s) | | | 13.0 | | | |
| Intersection Capacity Utilization | | | 81.6% | | | ICU Level of Service | | | | D | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 154: US 97 NB Ramp & Murphy Rd

10/02/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|--------|------|-------|------|---------------------------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 273 | 433 | 0 | 0 | 524 | 182 | 78 | 0 | 169 | 0 | 0 | 0 |
| Future Volume (vph) | 273 | 433 | 0 | 0 | 524 | 182 | 78 | 0 | 169 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | | 4.0 | | 4.0 | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | | 1.00 | | 1.00 | | | |
| Frt | 1.00 | 1.00 | | | 0.97 | | 1.00 | | 0.85 | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | | 0.95 | | 1.00 | | | |
| Satd. Flow (prot) | 1646 | 1733 | | | 1672 | | 1646 | | 1473 | | | |
| Flt Permitted | 0.13 | 1.00 | | | 1.00 | | 0.95 | | 1.00 | | | |
| Satd. Flow (perm) | 225 | 1733 | | | 1672 | | 1646 | | 1473 | | | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 294 | 466 | 0 | 0 | 563 | 196 | 84 | 0 | 182 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 158 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 294 | 466 | 0 | 0 | 740 | 0 | 84 | 0 | 24 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Turn Type | pm+pt | NA | | | NA | | Prot | | Perm | | | |
| Protected Phases | 7 | 4 | | | 8 | | 2 | | | | | |
| Permitted Phases | 4 | | | | | | | | 2 | | | |
| Actuated Green, G (s) | 43.2 | 43.2 | | | 26.8 | | 6.8 | | 6.8 | | | |
| Effective Green, g (s) | 43.2 | 44.2 | | | 27.8 | | 7.8 | | 7.8 | | | |
| Actuated g/C Ratio | 0.72 | 0.74 | | | 0.46 | | 0.13 | | 0.13 | | | |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | | 5.0 | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 455 | 1276 | | | 774 | | 213 | | 191 | | | |
| v/s Ratio Prot | c0.13 | 0.27 | | | c0.44 | | c0.05 | | | | | |
| v/s Ratio Perm | 0.33 | | | | | | | | 0.02 | | | |
| v/c Ratio | 0.65 | 0.37 | | | 0.96 | | 0.39 | | 0.12 | | | |
| Uniform Delay, d1 | 11.9 | 2.8 | | | 15.5 | | 23.9 | | 23.1 | | | |
| Progression Factor | 1.49 | 1.42 | | | 1.00 | | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | 1.6 | 0.4 | | | 23.3 | | 1.2 | | 0.3 | | | |
| Delay (s) | 19.3 | 4.5 | | | 38.8 | | 25.1 | | 23.4 | | | |
| Level of Service | B | A | | | D | | C | | C | | | |
| Approach Delay (s) | | 10.2 | | | 38.8 | | | 23.9 | | | 0.0 | |
| Approach LOS | | B | | | D | | | C | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 24.4 | | | | HCM 2000 Level of Service | | C | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.79 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 60.0 | | | | Sum of lost time (s) | | 12.0 | | | |
| Intersection Capacity Utilization | | | 110.6% | | | | ICU Level of Service | | H | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 5.8 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 122 | 111 | 64 | 329 | 419 | 95 |
| Future Vol, veh/h | 122 | 111 | 64 | 329 | 419 | 95 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 136 | 123 | 71 | 366 | 466 | 106 |

| Major/Minor | Minor2 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1027 | 519 | 572 | 0 | - | 0 |
| Stage 1 | 519 | - | - | - | - | - |
| Stage 2 | 508 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | 4.1 | - | - | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | 2.2 | - | - | - |
| Pot Cap-1 Maneuver | 262 | 561 | 1011 | - | - | - |
| Stage 1 | 601 | - | - | - | - | - |
| Stage 2 | 608 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 239 | 561 | 1011 | - | - | - |
| Mov Cap-2 Maneuver | 239 | - | - | - | - | - |
| Stage 1 | 548 | - | - | - | - | - |
| Stage 2 | 608 | - | - | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 26.2 | 1.4 | 0 |
| HCM LOS | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|-----------------------|------|-----|-------|-------|-----|-----|
| Capacity (veh/h) | 1011 | - | 239 | 561 | - | - |
| HCM Lane V/C Ratio | 0.07 | - | 0.567 | 0.22 | - | - |
| HCM Control Delay (s) | 8.8 | 0 | 38.1 | 13.2 | - | - |
| HCM Lane LOS | A | A | E | B | - | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 3.2 | 0.8 | - | - |

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 6.3 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Vol, veh/h | 21 | 0 | 48 | 5 | 5 | 32 | 95 | 525 | 5 | 58 | 1034 | 42 |
| Future Vol, veh/h | 21 | 0 | 48 | 5 | 5 | 32 | 95 | 525 | 5 | 58 | 1034 | 42 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 110 | - | 115 | 15 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 25 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 22 | 0 | 51 | 5 | 5 | 34 | 101 | 559 | 5 | 62 | 1100 | 45 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|------|--------|------|--------|-----|--------|---|---|------|---|---|
| Conflicting Flow All | 1736 | 2015 | 575 | 1438 | 2035 | 285 | 1147 | 0 | 0 | 564 | 0 | 0 |
| Stage 1 | 1249 | 1249 | - | 764 | 764 | - | - | - | - | - | - | - |
| Stage 2 | 487 | 766 | - | 674 | 1271 | - | - | - | - | - | - | - |
| Critical Hdwy | 8 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.22 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 7 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 7 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.75 | 4 | 3.3 | 3.5 | 4 | 3.3 | 2.26 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 44 | 59 | 466 | 95 | 58 | 718 | 582 | - | - | 1018 | - | - |
| Stage 1 | 151 | 247 | - | 367 | 416 | - | - | - | - | - | - | - |
| Stage 2 | 475 | 415 | - | 415 | 241 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | - | - | - |
| Mov Cap-1 Maneuver | 32 | 46 | 465 | 70 | 45 | 716 | 581 | - | - | 1018 | - | - |
| Mov Cap-2 Maneuver | 32 | 46 | - | 70 | 45 | - | - | - | - | - | - | - |
| Stage 1 | 125 | 231 | - | 303 | 344 | - | - | - | - | - | - | - |
| Stage 2 | 367 | 343 | - | 347 | 226 | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|-------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 128.5 | | 30.5 | | 1.9 | | 0.4 | |
| HCM LOS | F | | D | | | | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1WBLn1 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|------------|-------|-------|-----|
| Capacity (veh/h) | 581 | - | - | 91 | 185 | 1018 | - |
| HCM Lane V/C Ratio | 0.174 | - | - | 0.807 | 0.242 | 0.061 | - |
| HCM Control Delay (s) | 12.5 | - | - | 128.5 | 30.5 | 8.8 | - |
| HCM Lane LOS | B | - | - | F | D | A | - |
| HCM 95th %tile Q(veh) | 0.6 | - | - | 4.3 | 0.9 | 0.2 | - |

Intersection

Int Delay, s/veh 248.7

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | ↑ | ↑ | | ↑ | ↑ | |
| Traffic Vol, veh/h | 117 | 75 | 310 | 249 | 80 | 260 |
| Future Vol, veh/h | 117 | 75 | 310 | 249 | 80 | 260 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 300 | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 25 | 25 | 25 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 468 | 300 | 1240 | 996 | 320 | 1040 |

| Major/Minor | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 768 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | - | 4.1 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | - | 2.2 |
| Pot Cap-1 Maneuver | - | - | ~ 855 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | - | ~ 855 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | WB | NB |
|----------------------|----|-------|----------|
| HCM Control Delay, s | 0 | 124.6 | \$ 593.3 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|----------|-----|-----|-------|-----|
| Capacity (veh/h) | 599 | - | - | ~ 855 | - |
| HCM Lane V/C Ratio | 2.27 | - | - | 1.45 | - |
| HCM Control Delay (s) | \$ 593.3 | - | - | 224.6 | 0 |
| HCM Lane LOS | F | - | - | F | A |
| HCM 95th %tile Q(veh) | 100.2 | - | - | 56.4 | - |

Notes

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

HCM 6th TWSC
62: Powers Rd & Blakely Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 58.3 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 11 | 585 | 69 | 137 | 250 | 85 | 95 | 27 | 117 | 21 | 5 | 48 |
| Future Vol, veh/h | 11 | 585 | 69 | 137 | 250 | 85 | 95 | 27 | 117 | 21 | 5 | 48 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 17 | 2 | 2 | 0 |
| Mvmt Flow | 12 | 629 | 74 | 147 | 269 | 91 | 102 | 29 | 126 | 23 | 5 | 52 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-----|
| Conflicting Flow All | 360 | 0 | 0 | 703 | 0 | 0 | 1328 | 1344 | 670 | 1381 | 1336 | 316 |
| Stage 1 | - | - | - | - | - | - | 690 | 690 | - | 609 | 609 | - |
| Stage 2 | - | - | - | - | - | - | 638 | 654 | - | 772 | 727 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.11 | 6.53 | 6.37 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.11 | 5.53 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.11 | 5.53 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.509 | 4.027 | 3.453 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1210 | - | - | 904 | - | - | 133 | 151 | 432 | 121 | 153 | 729 |
| Stage 1 | - | - | - | - | - | - | 437 | 445 | - | 482 | 485 | - |
| Stage 2 | - | - | - | - | - | - | 467 | 462 | - | 392 | 429 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1210 | - | - | 904 | - | - | ~ 99 | 118 | 431 | 58 | 119 | 728 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 99 | 118 | - | 58 | 119 | - |
| Stage 1 | - | - | - | - | - | - | 430 | 438 | - | 474 | 385 | - |
| Stage 2 | - | - | - | - | - | - | 339 | 367 | - | 254 | 422 | - |

| Approach | EB | WB | NB | SB |
|----------------------|-----|-----|----------|------|
| HCM Control Delay, s | 0.1 | 2.8 | \$ 332.7 | 49.4 |
| HCM LOS | | | F | E |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|----------|------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h) | 164 | 1210 | - | - | 904 | - | - | 157 |
| HCM Lane V/C Ratio | 1.567 | 0.01 | - | - | 0.163 | - | - | 0.507 |
| HCM Control Delay (s) | \$ 332.7 | 8 | 0 | - | 9.8 | 0 | - | 49.4 |
| HCM Lane LOS | F | A | A | - | A | A | - | E |
| HCM 95th %tile Q(veh) | 17.2 | 0 | - | - | 0.6 | - | - | 2.5 |

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 8.1 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ↕ | ↕ | | ↕ | |
| Traffic Vol, veh/h | 11 | 788 | 731 | 175 | 150 | 70 |
| Future Vol, veh/h | 11 | 788 | 731 | 175 | 150 | 70 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 0 | 2 | 1 | 1 | 3 | 0 |
| Mvmt Flow | 11 | 821 | 761 | 182 | 156 | 73 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|---|-----------|
| Conflicting Flow All | 946 | 0 | - | 0 | 1698 855 |
| Stage 1 | - | - | - | - | 855 - |
| Stage 2 | - | - | - | - | 843 - |
| Critical Hdwy | 4.1 | - | - | - | 6.43 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.527 3.3 |
| Pot Cap-1 Maneuver | 734 | - | - | - | ~ 101 361 |
| Stage 1 | - | - | - | - | 415 - |
| Stage 2 | - | - | - | - | 420 - |
| Platoon blocked, % | | - | - | - | |
| Mov Cap-1 Maneuver | 732 | - | - | - | ~ 98 360 |
| Mov Cap-2 Maneuver | - | - | - | - | 230 - |
| Stage 1 | - | - | - | - | 403 - |
| Stage 2 | - | - | - | - | 419 - |

| Approach | EB | WB | SB |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.1 | 0 | 70.9 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 732 | - | - | - | 260 |
| HCM Lane V/C Ratio | 0.016 | - | - | - | 0.881 |
| HCM Control Delay (s) | 10 | 0 | - | - | 70.9 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 7.5 |

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

Bend Pkwy Powers OC Murphy Diamond

Vistro File:

X:\...\Roundabouts_PowersOC_MurphyDiamond.vistro

Scenario: Base Scenario

Report File: X:\...\PowersOC_MurphyDiamond.pdf

9/27/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|----|------------------------------|--------------|-----------------|------------|-----|---------------|-----|
| 2 | Powers Rd and Brookwood Blvd | Roundabout | HCM 6th Edition | SB Thru | | 94.0 | F |
| 3 | Murphy Rd and 3rd St | Roundabout | HCM 6th Edition | NB Right | | 72.6 | F |
| 5 | Parrell Rd and Murphy Rd | Roundabout | HCM 6th Edition | EB Thru | | 95.4 | F |
| 6 | US 97 NB ramp and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 15.2 | C |
| 7 | US 97 SB ramp and Murphy Rd | Roundabout | HCM 6th Edition | SB Right | | 53.7 | F |
| 8 | Brookwood Blvd and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 35.7 | E |
| 9 | Murphy Rd and Frontage Rd | Roundabout | HCM 6th Edition | WB Thru | | 8.7 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Powers Rd and Brookwood Blvd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 94.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 5 | 482 | 145 | 455 | 647 | 58 | 58 | 65 | 5 | 205 | 74 | 114 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 482 | 145 | 455 | 647 | 58 | 58 | 65 | 5 | 205 | 74 | 114 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 131 | 39 | 124 | 176 | 16 | 16 | 18 | 1 | 56 | 20 | 31 |
| Total Analysis Volume [veh/h] | 5 | 524 | 158 | 495 | 703 | 63 | 63 | 71 | 5 | 223 | 80 | 124 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|----|------|----|---|-----|----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 642 | | | 314 | | | 1449 | | | 604 | | |
| Exiting Flow Rate [veh/h] | 950 | | | 725 | | | 151 | | | 738 | | |
| Demand Flow Rate [veh/h] | 5 | 482 | 145 | 455 | 647 | 58 | 58 | 65 | 5 | 205 | 74 | 114 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 524 | 158 | 495 | 703 | 63 | 63 | 71 | 5 | 223 | 80 | 124 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Overwrite Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Overwrite Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 701 | | | 1287 | | | 142 | | | 436 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 718 | | | 1002 | | | 315 | | | 746 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 704 | | | 983 | | | 309 | | | 731 | | |
| X, volume / capacity | 0.98 | | | 1.28 | | | 0.45 | | | 0.58 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|---------|--|--|-------|--|--|-------|--|--|
| Lane LOS | F | | | F | | | C | | | B | | |
| 95th-Percentile Queue Length [veh] | 15.07 | | | 45.31 | | | 2.23 | | | 3.83 | | |
| 95th-Percentile Queue Length [ft] | 376.77 | | | 1132.78 | | | 55.66 | | | 95.76 | | |
| Approach Delay [s/veh] | 52.55 | | | 151.36 | | | 23.15 | | | 14.53 | | |
| Approach LOS | F | | | F | | | C | | | B | | |
| Intersection Delay [s/veh] | 94.03 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 3: Murphy Rd and 3rd St**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 72.6
 Level Of Service: F

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | +← | | | ←+ | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 150.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 42 | 244 | 375 | 234 | 475 | 160 | 223 | 190 | 13 | 371 | 260 | 170 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 3.00 | 11.00 | 2.00 | 2.00 | 0.00 | 2.00 | 1.00 | 0.00 | 3.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 42 | 244 | 375 | 234 | 475 | 160 | 223 | 190 | 13 | 371 | 260 | 170 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 66 | 101 | 63 | 128 | 43 | 60 | 51 | 3 | 100 | 70 | 46 |
| Total Analysis Volume [veh/h] | 45 | 262 | 403 | 252 | 511 | 172 | 240 | 204 | 14 | 399 | 280 | 183 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|------|-----|----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 708 | | | 739 | | | 1189 | | | 560 | | |
| Exiting Flow Rate [veh/h] | 946 | | | 699 | | | 500 | | | 910 | | |
| Demand Flow Rate [veh/h] | 42 | 244 | 375 | 234 | 475 | 160 | 223 | 190 | 13 | 371 | 260 | 170 |
| Adjusted Demand Flow Rate [veh/h] | 45 | 262 | 403 | 252 | 511 | 172 | 240 | 204 | 14 | 399 | 280 | 183 |

Lanes

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Override Calculated Critical Headway | No | No | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Override Calculated Follow-Up Time | No | No | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1420.00 | 1420.00 | 1420.00 | 1420.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00102 |
| HV Adjustment Factor | 0.93 | 0.98 | 0.99 | 0.98 | 1.00 | 0.98 |
| Entry Flow Rate [veh/h] | 761 | 258 | 694 | 451 | 14 | 879 |
| Capacity of Entry and Bypass Lanes [veh/h] | 671 | 725 | 725 | 482 | 482 | 780 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 626 | 711 | 715 | 474 | 482 | 766 |
| X, volume / capacity | 1.14 | 0.35 | 0.96 | 0.94 | 0.03 | 1.13 |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|-------|--------|--------|------|--------|
| Lane LOS | F | A | E | F | A | F |
| 95th-Percentile Queue Length [veh] | 22.44 | 1.60 | 14.16 | 11.17 | 0.09 | 25.03 |
| 95th-Percentile Queue Length [ft] | 560.89 | 40.08 | 354.12 | 279.26 | 2.24 | 625.71 |
| Approach Delay [s/veh] | 103.34 | 37.32 | | 54.96 | | 94.75 |
| Approach LOS | F | E | | F | | F |
| Intersection Delay [s/veh] | 72.55 | | | | | |
| Intersection LOS | F | | | | | |

**Intersection Level Of Service Report
Intersection 5: Parrell Rd and Murphy Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 95.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Parrell Road | | | | | | | | | | | |
|------------------------|--------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Parrell Road | | | | | | | | | | | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 270 | 95 | 48 | 186 | 186 | 116 | 133 | 535 | 270 | 148 | 520 | 143 |
| Base Volume Input [veh/h] | 270 | 95 | 48 | 186 | 186 | 116 | 133 | 535 | 270 | 148 | 520 | 143 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 0.00 | 0.00 | 3.00 | 1.00 | 3.00 | 4.00 | 2.00 | 1.00 | 3.00 | 2.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 270 | 95 | 48 | 186 | 186 | 116 | 133 | 535 | 270 | 148 | 520 | 143 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 70 | 25 | 13 | 48 | 48 | 30 | 35 | 139 | 70 | 39 | 135 | 37 |
| Total Analysis Volume [veh/h] | 281 | 99 | 50 | 194 | 194 | 121 | 139 | 557 | 281 | 154 | 542 | 149 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 913 | | | 992 | | | 554 | | | 525 | | |
| Exiting Flow Rate [veh/h] | 638 | | | 394 | | | 958 | | | 818 | | |
| Demand Flow Rate [veh/h] | 270 | 95 | 48 | 186 | 186 | 116 | 133 | 535 | 270 | 148 | 520 | 143 |
| Adjusted Demand Flow Rate [veh/h] | 281 | 99 | 50 | 194 | 194 | 121 | 139 | 557 | 281 | 154 | 542 | 149 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 1.00 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 430 | | | 521 | | | 997 | | | 862 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 545 | | | 502 | | | 784 | | | 809 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 545 | | | 491 | | | 769 | | | 793 | | |
| X, volume / capacity | 0.79 | | | 1.04 | | | 1.27 | | | 1.07 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | D | | | F | | | F | | | F | | |
| 95th-Percentile Queue Length [veh] | 7.43 | | | 15.02 | | | 36.17 | | | 21.40 | | |
| 95th-Percentile Queue Length [ft] | 185.84 | | | 375.45 | | | 904.20 | | | 534.89 | | |
| Approach Delay [s/veh] | 31.06 | | | 79.96 | | | 150.63 | | | 73.54 | | |
| Approach LOS | D | | | F | | | F | | | F | | |
| Intersection Delay [s/veh] | 95.39 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

Intersection Level Of Service Report
Intersection 8: Brookwood Blvd and Murphy Rd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 35.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|------------------------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Approach | Northeastbound | | | Southwestbound | | | Northwestbound | | | Southeastbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|---|----------------|--------|--------|-----------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 5 | 360 | 225 | 180 | 525 | 80 | 345 | 122 | 170 | 53 | 55 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 2.00 | 0.00 | 1.00 | 1.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 360 | 225 | 180 | 525 | 80 | 345 | 122 | 170 | 53 | 55 | 5 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 97 | 60 | 48 | 141 | 22 | 93 | 33 | 46 | 14 | 15 | 1 |
| Total Analysis Volume [veh/h] | 5 | 387 | 242 | 194 | 565 | 86 | 371 | 131 | 183 | 57 | 59 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|----|-----|-----|-----|------|----|---|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 312 | | | 514 | | | 457 | | | 1145 | | |
| Exiting Flow Rate [veh/h] | 954 | | | 638 | | | 497 | | | 222 | | |
| Demand Flow Rate [veh/h] | 5 | 360 | 225 | 180 | 525 | 80 | 345 | 122 | 170 | 53 | 55 | 5 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 387 | 242 | 194 | 565 | 86 | 371 | 131 | 183 | 57 | 59 | 5 |

Lanes

| | | | | |
|--|---------|---------|---------|---------|
| Overwrite Calculated Critical Headway | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 |
| Overwrite Calculated Follow-Up Time | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1380.00 | 1380.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00102 | 0.00102 | 0.00102 |
| HV Adjustment Factor | 0.99 | 0.99 | 0.98 | 1.00 |
| Entry Flow Rate [veh/h] | 642 | 853 | 697 | 121 |
| Capacity of Entry and Bypass Lanes [veh/h] | 1004 | 817 | 867 | 430 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 992 | 810 | 853 | 430 |
| X, volume / capacity | 0.64 | 1.04 | 0.80 | 0.28 |

Movement, Approach, & Intersection Results

| | | | | |
|------------------------------------|--------|--------|--------|-------|
| Lane LOS | B | F | C | B |
| 95th-Percentile Queue Length [veh] | 4.80 | 20.17 | 8.68 | 1.14 |
| 95th-Percentile Queue Length [ft] | 119.99 | 504.25 | 216.98 | 28.60 |
| Approach Delay [s/veh] | 13.02 | 66.15 | 23.05 | 13.06 |
| Approach LOS | B | F | C | B |
| Intersection Delay [s/veh] | 35.67 | | | |
| Intersection LOS | E | | | |

Intersection Level Of Service Report
Intersection 9: Murphy Rd and Frontage Rd

| | | | |
|------------------|-----------------|--------------------|-----|
| Control Type: | Roundabout | Delay (sec / veh): | 8.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|------------------------|-------------|--------|-----------|--------|-----------|--------|
| Approach | Northbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Thru | Right | Left | Thru |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | 30.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | Yes | | Yes | | Yes | |

Volumes

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|---|-------------|--------|-----------|--------|-----------|--------|
| Base Volume Input [veh/h] | 292 | 140 | 296 | 164 | 117 | 345 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 292 | 140 | 296 | 164 | 117 | 345 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 78 | 38 | 80 | 44 | 31 | 93 |
| Total Analysis Volume [veh/h] | 314 | 151 | 318 | 176 | 126 | 371 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

Intersection Settings

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | 1 | | 1 | |
| Circulating Flow Rate [veh/h] | 321 | | 127 | | 317 | |
| Exiting Flow Rate [veh/h] | 305 | | 692 | | 474 | |
| Demand Flow Rate [veh/h] | 292 | 140 | 296 | 164 | 117 | 345 |
| Adjusted Demand Flow Rate [veh/h] | 314 | 151 | 318 | 176 | 126 | 371 |

Lanes

| | | | | | | |
|--|---------|--|---------|--|---------|--|
| Overwrite Calculated Critical Headway | No | | No | | No | |
| User-Defined Critical Headway [s] | 4.00 | | 4.00 | | 4.00 | |
| Overwrite Calculated Follow-Up Time | No | | No | | No | |
| User-Defined Follow-Up Time [s] | 3.00 | | 3.00 | | 3.00 | |
| A (intercept) | 1380.00 | | 1380.00 | | 1380.00 | |
| B (coefficient) | 0.00102 | | 0.00102 | | 0.00102 | |
| HV Adjustment Factor | 0.99 | | 0.99 | | 0.99 | |
| Entry Flow Rate [veh/h] | 470 | | 499 | | 502 | |
| Capacity of Entry and Bypass Lanes [veh/h] | 995 | | 1213 | | 999 | |
| Pedestrian Impedance | 1.00 | | 1.00 | | 1.00 | |
| Capacity per Entry Lane [veh/h] | 985 | | 1201 | | 989 | |
| X, volume / capacity | 0.47 | | 0.41 | | 0.50 | |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|-------|--|-------|--|-------|--|
| Lane LOS | A | | A | | A | |
| 95th-Percentile Queue Length [veh] | 2.58 | | 2.05 | | 2.90 | |
| 95th-Percentile Queue Length [ft] | 64.55 | | 51.29 | | 72.40 | |
| Approach Delay [s/veh] | 9.25 | | 7.14 | | 9.78 | |
| Approach LOS | A | | A | | A | |
| Intersection Delay [s/veh] | | | 8.71 | | | |
| Intersection LOS | | | A | | | |

2040 30HV Powers Overcrossing and Murphy Loops + Frontage HCM

HCM Signalized Intersection Capacity Analysis

54: Powers Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|-------|-------|------|------|-------|------|
| Lane Configurations | ↖ | ↑ | ↗ | ↖ | ↗ | | ↖ | ↑↗ | | ↖ | ↑↗ | |
| Traffic Volume (vph) | 318 | 186 | 180 | 21 | 58 | 80 | 70 | 615 | 11 | 16 | 1118 | 313 |
| Future Volume (vph) | 318 | 186 | 180 | 21 | 58 | 80 | 70 | 615 | 11 | 16 | 1118 | 313 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1630 | 1733 | 1467 | 1612 | 1582 | | 1662 | 3215 | | 1630 | 3149 | |
| Flt Permitted | 0.62 | 1.00 | 1.00 | 0.55 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1072 | 1733 | 1467 | 936 | 1582 | | 1662 | 3215 | | 1630 | 3149 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 342 | 200 | 194 | 23 | 62 | 86 | 75 | 661 | 12 | 17 | 1202 | 337 |
| RTOR Reduction (vph) | 0 | 0 | 72 | 0 | 52 | 0 | 0 | 1 | 0 | 0 | 25 | 0 |
| Lane Group Flow (vph) | 342 | 200 | 122 | 23 | 96 | 0 | 75 | 672 | 0 | 17 | 1514 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 2 | | | | | 2 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 3% | 1% | 1% | 0% | 3% | 11% | 2% | 2% | 0% |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 8 | | | 4 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 8 | | 8 | 4 | | | | | | | | |
| Actuated Green, G (s) | 33.7 | 33.7 | 33.7 | 33.7 | 33.7 | | 5.8 | 51.1 | | 2.0 | 47.3 | |
| Effective Green, g (s) | 33.7 | 33.7 | 33.7 | 33.7 | 33.7 | | 5.8 | 52.3 | | 2.0 | 48.5 | |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | | 0.06 | 0.52 | | 0.02 | 0.48 | |
| Clearance Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 5.2 | | 4.0 | 5.2 | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 2.5 | 5.2 | | 2.5 | 5.2 | |
| Lane Grp Cap (vph) | 361 | 584 | 494 | 315 | 533 | | 96 | 1681 | | 32 | 1527 | |
| v/s Ratio Prot | | 0.12 | | | 0.06 | | c0.05 | c0.21 | | 0.01 | c0.48 | |
| v/s Ratio Perm | c0.32 | | 0.08 | 0.02 | | | | | | | | |
| v/c Ratio | 0.95 | 0.34 | 0.25 | 0.07 | 0.18 | | 0.78 | 0.40 | | 0.53 | 0.99 | |
| Uniform Delay, d1 | 32.3 | 24.8 | 24.0 | 22.5 | 23.4 | | 46.5 | 14.4 | | 48.5 | 25.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 33.8 | 0.4 | 0.3 | 0.1 | 0.2 | | 31.8 | 0.7 | | 12.5 | 21.1 | |
| Delay (s) | 66.1 | 25.3 | 24.3 | 22.6 | 23.6 | | 78.3 | 15.1 | | 61.1 | 46.7 | |
| Level of Service | E | C | C | C | C | | E | B | | E | D | |
| Approach Delay (s) | | 44.0 | | | 23.5 | | | 21.4 | | | 46.8 | |
| Approach LOS | | D | | | C | | | C | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 39.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 89.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

57: Badger Rd & SE 3rd St

09/30/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|------|-------|----------------------|---------------------------|------|------|-------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 16 | 16 | 74 | 21 | 32 | 21 | 461 | 37 | 32 | 981 | 95 |
| Future Volume (vph) | 74 | 16 | 16 | 74 | 21 | 32 | 21 | 461 | 37 | 32 | 981 | 95 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.93 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1662 | 1619 | | | 1685 | 1488 | 1662 | 3286 | | 1662 | 3274 | |
| Flt Permitted | 0.64 | 1.00 | | | 0.75 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1125 | 1619 | | | 1315 | 1488 | 1662 | 3286 | | 1662 | 3274 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 80 | 17 | 17 | 80 | 23 | 35 | 23 | 501 | 40 | 35 | 1066 | 103 |
| RTOR Reduction (vph) | 0 | 15 | 0 | 0 | 0 | 31 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 80 | 19 | 0 | 0 | 103 | 4 | 23 | 538 | 0 | 35 | 1165 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 2 | | | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | | 6 |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | |
| Actuated Green, G (s) | 10.8 | 10.8 | | | 10.8 | 10.8 | 3.6 | 60.1 | | 4.7 | | 61.2 |
| Effective Green, g (s) | 11.3 | 11.3 | | | 11.3 | 11.3 | 4.1 | 61.5 | | 5.2 | | 62.6 |
| Actuated g/C Ratio | 0.13 | 0.13 | | | 0.13 | 0.13 | 0.05 | 0.68 | | 0.06 | | 0.70 |
| Clearance Time (s) | 4.5 | 4.5 | | | 4.5 | 4.5 | 4.5 | 5.4 | | 4.5 | | 5.4 |
| Vehicle Extension (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | 4.2 | | 2.5 | | 4.7 |
| Lane Grp Cap (vph) | 141 | 203 | | | 165 | 186 | 75 | 2245 | | 96 | | 2277 |
| v/s Ratio Prot | | 0.01 | | | | | 0.01 | 0.16 | | c0.02 | | c0.36 |
| v/s Ratio Perm | 0.07 | | | | c0.08 | 0.00 | | | | | | |
| v/c Ratio | 0.57 | 0.09 | | | 0.62 | 0.02 | 0.31 | 0.24 | | 0.36 | | 0.51 |
| Uniform Delay, d1 | 37.0 | 34.8 | | | 37.3 | 34.5 | 41.6 | 5.4 | | 40.8 | | 6.5 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 |
| Incremental Delay, d2 | 6.2 | 0.3 | | | 8.1 | 0.1 | 3.2 | 0.3 | | 1.7 | | 0.8 |
| Delay (s) | 43.3 | 35.1 | | | 45.4 | 34.6 | 44.7 | 5.6 | | 42.5 | | 7.3 |
| Level of Service | D | D | | | D | C | D | A | | D | | A |
| Approach Delay (s) | | 40.8 | | | 42.7 | | | 7.2 | | | | 8.3 |
| Approach LOS | | D | | | D | | | A | | | | A |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 12.2 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.53 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 90.0 | | | Sum of lost time (s) | | | | 12.0 | | |
| Intersection Capacity Utilization | | | 51.7% | | | ICU Level of Service | | | | A | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 5.4 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 123 | 90 | 64 | 329 | 376 | 95 |
| Future Vol, veh/h | 123 | 90 | 64 | 329 | 376 | 95 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 50 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 137 | 100 | 71 | 366 | 418 | 106 |

| Major/Minor | Minor2 | Major1 | Major2 | | | |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 979 | 471 | 524 | 0 | - | 0 |
| Stage 1 | 471 | - | - | - | - | - |
| Stage 2 | 508 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | 4.1 | - | - | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | 2.2 | - | - | - |
| Pot Cap-1 Maneuver | 280 | 597 | 1053 | - | - | - |
| Stage 1 | 632 | - | - | - | - | - |
| Stage 2 | 608 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 256 | 597 | 1053 | - | - | - |
| Mov Cap-2 Maneuver | 256 | - | - | - | - | - |
| Stage 1 | 578 | - | - | - | - | - |
| Stage 2 | 608 | - | - | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 24.8 | 1.4 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|-----------------------|-------|-----|-------|-------|-----|-----|
| Capacity (veh/h) | 1053 | - | 256 | 597 | - | - |
| HCM Lane V/C Ratio | 0.068 | - | 0.534 | 0.168 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | 34.1 | 12.2 | - | - |
| HCM Lane LOS | A | A | D | B | - | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 2.9 | 0.6 | - | - |

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 3.8 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Vol, veh/h | 16 | 0 | 42 | 5 | 5 | 32 | 95 | 493 | 5 | 58 | 959 | 42 |
| Future Vol, veh/h | 16 | 0 | 42 | 5 | 5 | 32 | 95 | 493 | 5 | 58 | 959 | 42 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 110 | - | 115 | 15 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 25 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 17 | 0 | 45 | 5 | 5 | 34 | 101 | 524 | 5 | 62 | 1020 | 45 |

| Major/Minor | Minor2 | | Minor1 | | Major1 | | Major2 | | | | | |
|----------------------|--------|------|--------|------|--------|-----|--------|---|---|------|---|---|
| Conflicting Flow All | 1639 | 1900 | 535 | 1363 | 1920 | 268 | 1067 | 0 | 0 | 529 | 0 | 0 |
| Stage 1 | 1169 | 1169 | - | 729 | 729 | - | - | - | - | - | - | - |
| Stage 2 | 470 | 731 | - | 634 | 1191 | - | - | - | - | - | - | - |
| Critical Hdwy | 8 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.22 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 7 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 7 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.75 | 4 | 3.3 | 3.5 | 4 | 3.3 | 2.26 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 52 | 70 | 495 | 109 | 68 | 736 | 626 | - | - | 1048 | - | - |
| Stage 1 | 171 | 269 | - | 385 | 431 | - | - | - | - | - | - | - |
| Stage 2 | 487 | 430 | - | 439 | 263 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | - | - | - |
| Mov Cap-1 Maneuver | 38 | 55 | 494 | 83 | 54 | 734 | 625 | - | - | 1048 | - | - |
| Mov Cap-2 Maneuver | 38 | 55 | - | 83 | 54 | - | - | - | - | - | - | - |
| Stage 1 | 143 | 253 | - | 323 | 361 | - | - | - | - | - | - | - |
| Stage 2 | 383 | 360 | - | 376 | 247 | - | - | - | - | - | - | - |

| Approach | EB | | WB | | NB | | SB | |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 67.8 | | 26.2 | | 1.9 | | 0.5 | |
| HCM LOS | F | | D | | | | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1WBLn1 | SBL | SBT | SBR |
|-----------------------|-------|-----|-----|------------|-------|-------|-----|
| Capacity (veh/h) | 625 | - | - | 115 | 214 | 1048 | - |
| HCM Lane V/C Ratio | 0.162 | - | - | 0.537 | 0.209 | 0.059 | - |
| HCM Control Delay (s) | 11.9 | - | - | 67.8 | 26.2 | 8.7 | - |
| HCM Lane LOS | B | - | - | F | D | A | - |
| HCM 95th %tile Q(veh) | 0.6 | - | - | 2.5 | 0.8 | 0.2 | - |

Intersection

Int Delay, s/veh 605.2

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | ↑ | ↑ | | ↑ | ↑ | |
| Traffic Vol, veh/h | 413 | 30 | 275 | 286 | 50 | 140 |
| Future Vol, veh/h | 413 | 30 | 275 | 286 | 50 | 140 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 300 | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 25 | 25 | 25 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 1652 | 120 | 1100 | 1144 | 200 | 560 |

| Major/Minor | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0 | 0 | 1772 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | - | 4.1 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | - | 2.2 |
| Pot Cap-1 Maneuver | - | - | ~ 356 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | - | ~ 356 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | WB | NB |
|----------------------|----|----------|-----------|
| HCM Control Delay, s | 0 | \$ 475.6 | \$ 2399.2 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|-----------------------|-----------|-----|-----|----------|-----|
| Capacity (veh/h) | 123 | - | - | ~ 356 | - |
| HCM Lane V/C Ratio | 6.179 | - | - | 3.09 | - |
| HCM Control Delay (s) | \$ 2399.2 | - | - | \$ 970.3 | 0 |
| HCM Lane LOS | F | - | - | F | A |
| HCM 95th %tile Q(veh) | 83.1 | - | - | 97.2 | - |

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

HCM 6th TWSC
62: Powers Rd & Blakely Rd

09/30/2019

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 36.5 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 11 | 589 | 69 | 117 | 239 | 85 | 95 | 27 | 74 | 21 | 5 | 48 |
| Future Vol, veh/h | 11 | 589 | 69 | 117 | 239 | 85 | 95 | 27 | 74 | 21 | 5 | 48 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 17 | 2 | 2 | 0 |
| Mvmt Flow | 12 | 633 | 74 | 126 | 257 | 91 | 102 | 29 | 80 | 23 | 5 | 52 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-----|
| Conflicting Flow All | 348 | 0 | 0 | 707 | 0 | 0 | 1278 | 1294 | 674 | 1308 | 1286 | 304 |
| Stage 1 | - | - | - | - | - | - | 694 | 694 | - | 555 | 555 | - |
| Stage 2 | - | - | - | - | - | - | 584 | 600 | - | 753 | 731 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.11 | 6.53 | 6.37 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.11 | 5.53 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.11 | 5.53 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.509 | 4.027 | 3.453 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1222 | - | - | 901 | - | - | 144 | 162 | 430 | 136 | 164 | 740 |
| Stage 1 | - | - | - | - | - | - | 435 | 443 | - | 516 | 513 | - |
| Stage 2 | - | - | - | - | - | - | 499 | 488 | - | 402 | 427 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1222 | - | - | 901 | - | - | 111 | 131 | 429 | 79 | 133 | 739 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 111 | 131 | - | 79 | 133 | - |
| Stage 1 | - | - | - | - | - | - | 428 | 436 | - | 508 | 423 | - |
| Stage 2 | - | - | - | - | - | - | 377 | 402 | - | 300 | 420 | - |

| Approach | EB | | | WB | | | NB | | | SB | | |
|----------------------|-----|--|--|-----|--|--|-------|--|--|------|--|--|
| HCM Control Delay, s | 0.1 | | | 2.6 | | | 238.2 | | | 34.2 | | |
| HCM LOS | | | | | | | F | | | D | | |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|------|-----|-----|------|-----|-----|-------|
| Capacity (veh/h) | 159 | 1222 | - | - | 901 | - | - | 201 |
| HCM Lane V/C Ratio | 1.325 | 0.01 | - | - | 0.14 | - | - | 0.396 |
| HCM Control Delay (s) | 238.2 | 8 | 0 | - | 9.6 | 0 | - | 34.2 |
| HCM Lane LOS | F | A | A | - | A | A | - | D |
| HCM 95th %tile Q(veh) | 12.7 | 0 | - | - | 0.5 | - | - | 1.8 |

HCM 6th TWSC
155: Murphy Rd & Old Murphy Rd

09/30/2019

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 12.3 | | | | | |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ↕ | ↕ | | ↕ | |
| Traffic Vol, veh/h | 11 | 726 | 741 | 170 | 85 | 70 |
| Future Vol, veh/h | 11 | 726 | 741 | 170 | 85 | 70 |
| Conflicting Peds, #/hr | 3 | 0 | 0 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 0 | 2 | 1 | 1 | 3 | 0 |
| Mvmt Flow | 11 | 756 | 772 | 177 | 89 | 73 |

| Major/Minor | Major1 | Major2 | Minor2 | | |
|----------------------|--------|--------|--------|-------|-----|
| Conflicting Flow All | 952 | 0 | 0 | 1642 | 864 |
| Stage 1 | - | - | - | 864 | - |
| Stage 2 | - | - | - | 778 | - |
| Critical Hdwy | 4.1 | - | - | 6.43 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | 5.43 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.527 | 3.3 |
| Pot Cap-1 Maneuver | 730 | - | - | 109 | 357 |
| Stage 1 | - | - | - | 411 | - |
| Stage 2 | - | - | - | 451 | - |
| Platoon blocked, % | | - | - | | |
| Mov Cap-1 Maneuver | 728 | - | - | 106 | 356 |
| Mov Cap-2 Maneuver | - | - | - | 106 | - |
| Stage 1 | - | - | - | 399 | - |
| Stage 2 | - | - | - | 450 | - |

| Approach | EB | WB | SB |
|----------------------|-----|----|-------|
| HCM Control Delay, s | 0.1 | 0 | 142.4 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h) | 728 | - | - | - | 155 |
| HCM Lane V/C Ratio | 0.016 | - | - | - | 1.042 |
| HCM Control Delay (s) | 10 | 0 | - | - | 142.4 |
| HCM Lane LOS | B | A | - | - | F |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 8.2 |

Bend Pkwy Powers OC Murphy Frontage

Vistro File:

X:\...\Roundabouts_PowersOC_MurphyFrontage.vistro

Scenario: Base Scenario

Report File: X:\...\PowersOC_MurphyFrontage.pdf

9/27/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|----|------------------------------|--------------|-----------------|------------|-----|---------------|-----|
| 2 | Powers Rd and Brookwood Blvd | Roundabout | HCM 6th Edition | SB Thru | | 85.0 | F |
| 3 | Murphy Rd and 3rd St | Roundabout | HCM 6th Edition | EB Thru | | 91.1 | F |
| 5 | Parrell Rd and Murphy Rd | Roundabout | HCM 6th Edition | WB Thru | | 41.0 | E |
| 8 | Brookwood Blvd and Murphy Rd | Roundabout | HCM 6th Edition | SWB Thru | | 45.3 | E |
| 9 | Murphy Rd and Frontage Rd | Roundabout | HCM 6th Edition | NB Right | | 12.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Powers Rd and Brookwood Blvd

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 85.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | | | | | | | | | | | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 5 | 472 | 135 | 470 | 615 | 58 | 58 | 64 | 5 | 191 | 74 | 117 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 472 | 135 | 470 | 615 | 58 | 58 | 64 | 5 | 191 | 74 | 117 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 128 | 37 | 128 | 167 | 16 | 16 | 17 | 1 | 52 | 20 | 32 |
| Total Analysis Volume [veh/h] | 5 | 513 | 147 | 511 | 668 | 63 | 63 | 70 | 5 | 208 | 80 | 127 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|----|------|----|---|-----|----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 657 | | | 299 | | | 1415 | | | 593 | | |
| Exiting Flow Rate [veh/h] | 899 | | | 717 | | | 151 | | | 743 | | |
| Demand Flow Rate [veh/h] | 5 | 472 | 135 | 470 | 615 | 58 | 58 | 64 | 5 | 191 | 74 | 117 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 513 | 147 | 511 | 668 | 63 | 63 | 70 | 5 | 208 | 80 | 127 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 679 | | | 1267 | | | 141 | | | 424 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 707 | | | 1018 | | | 326 | | | 754 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 693 | | | 998 | | | 320 | | | 740 | | |
| X, volume / capacity | 0.96 | | | 1.25 | | | 0.43 | | | 0.56 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|---------|--|--|-------|--|--|-------|--|--|
| Lane LOS | E | | | F | | | C | | | B | | |
| 95th-Percentile Queue Length [veh] | 14.18 | | | 41.73 | | | 2.09 | | | 3.53 | | |
| 95th-Percentile Queue Length [ft] | 354.43 | | | 1043.25 | | | 52.20 | | | 88.31 | | |
| Approach Delay [s/veh] | 49.36 | | | 134.95 | | | 21.72 | | | 13.73 | | |
| Approach LOS | E | | | F | | | C | | | B | | |
| Intersection Delay [s/veh] | 85.01 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 3: Murphy Rd and 3rd St**

Control Type: Roundabout
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 91.1
 Level Of Service: F

Intersection Setup

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | + | | | + | | | + | | | + | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 150.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h] | 48 | 170 | 164 | 223 | 462 | 270 | 292 | 350 | 312 | 286 | 355 | 170 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 3.00 | 11.00 | 2.00 | 2.00 | 0.00 | 2.00 | 1.00 | 0.00 | 3.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 170 | 164 | 223 | 462 | 270 | 292 | 350 | 312 | 286 | 355 | 170 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 13 | 46 | 44 | 60 | 124 | 73 | 78 | 94 | 84 | 77 | 95 | 46 |
| Total Analysis Volume [veh/h] | 52 | 183 | 176 | 240 | 497 | 290 | 314 | 376 | 335 | 308 | 382 | 183 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 945 | | | 755 | | | 1069 | | | 561 | | |
| Exiting Flow Rate [veh/h] | 1159 | | | 694 | | | 728 | | | 820 | | |
| Demand Flow Rate [veh/h] | 48 | 170 | 164 | 223 | 462 | 270 | 292 | 350 | 312 | 286 | 355 | 170 |
| Adjusted Demand Flow Rate [veh/h] | 52 | 183 | 176 | 240 | 497 | 290 | 314 | 376 | 335 | 308 | 382 | 183 |

Lanes

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Override Calculated Critical Headway | No | No | No | No | No | No |
| User-Defined Critical Headway [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Override Calculated Follow-Up Time | No | No | No | No | No | No |
| User-Defined Follow-Up Time [s] | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| A (intercept) | 1380.00 | 1420.00 | 1420.00 | 1420.00 | 1420.00 | 1380.00 |
| B (coefficient) | 0.00102 | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00102 |
| HV Adjustment Factor | 0.94 | 0.98 | 0.99 | 0.99 | 1.00 | 0.98 |
| Entry Flow Rate [veh/h] | 436 | 245 | 797 | 701 | 335 | 888 |
| Capacity of Entry and Bypass Lanes [veh/h] | 527 | 715 | 715 | 537 | 537 | 779 |
| Pedestrian Impedance | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capacity per Entry Lane [veh/h] | 498 | 701 | 706 | 530 | 537 | 766 |
| X, volume / capacity | 0.83 | 0.34 | 1.12 | 1.30 | 0.62 | 1.14 |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|-------|--------|--------|--------|--------|
| Lane LOS | E | A | F | F | C | F |
| 95th-Percentile Queue Length [veh] | 8.15 | 1.52 | 23.02 | 29.02 | 4.26 | 25.99 |
| 95th-Percentile Queue Length [ft] | 203.64 | 38.10 | 575.38 | 725.61 | 106.51 | 649.68 |
| Approach Delay [s/veh] | 37.29 | 73.50 | | 123.33 | | 99.49 |
| Approach LOS | E | F | | F | | F |
| Intersection Delay [s/veh] | 91.15 | | | | | |
| Intersection LOS | F | | | | | |

**Intersection Level Of Service Report
Intersection 5: Parrell Rd and Murphy Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 41.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Parrell Road | | | | | | | | | | | |
|------------------------|--------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Parrell Road | | | | | | | | | | | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 200 | 95 | 48 | 186 | 143 | 116 | 133 | 535 | 143 | 64 | 595 | 143 |
| Base Volume Input [veh/h] | 200 | 95 | 48 | 186 | 143 | 116 | 133 | 535 | 143 | 64 | 595 | 143 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 0.00 | 0.00 | 3.00 | 1.00 | 3.00 | 4.00 | 2.00 | 1.00 | 3.00 | 2.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 200 | 95 | 48 | 186 | 143 | 116 | 133 | 535 | 143 | 64 | 595 | 143 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 52 | 25 | 13 | 48 | 37 | 30 | 35 | 139 | 37 | 17 | 155 | 37 |
| Total Analysis Volume [veh/h] | 208 | 99 | 50 | 194 | 149 | 121 | 139 | 557 | 149 | 67 | 620 | 149 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 913 | | | 909 | | | 419 | | | 452 | | |
| Exiting Flow Rate [veh/h] | 370 | | | 394 | | | 965 | | | 818 | | |
| Demand Flow Rate [veh/h] | 200 | 95 | 48 | 186 | 143 | 116 | 133 | 535 | 143 | 64 | 595 | 143 |
| Adjusted Demand Flow Rate [veh/h] | 208 | 99 | 50 | 194 | 149 | 121 | 139 | 557 | 149 | 67 | 620 | 149 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Override Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Override Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 1.00 | | | 0.98 | | | 0.98 | | | 0.98 | | |
| Entry Flow Rate [veh/h] | 357 | | | 475 | | | 864 | | | 852 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 545 | | | 546 | | | 900 | | | 871 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 545 | | | 534 | | | 881 | | | 855 | | |
| X, volume / capacity | 0.66 | | | 0.87 | | | 0.96 | | | 0.98 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | C | | | E | | | E | | | E | | |
| 95th-Percentile Queue Length [veh] | 4.76 | | | 9.55 | | | 15.70 | | | 16.59 | | |
| 95th-Percentile Queue Length [ft] | 118.93 | | | 238.85 | | | 392.48 | | | 414.79 | | |
| Approach Delay [s/veh] | 21.64 | | | 41.01 | | | 42.71 | | | 47.60 | | |
| Approach LOS | C | | | E | | | E | | | E | | |
| Intersection Delay [s/veh] | 41.02 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 8: Brookwood Blvd and Murphy Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 45.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|------------------------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Approach | Northeastbound | | | Southwestbound | | | Northwestbound | | | Southeastbound | | |
| Lane Configuration | + | | | + | | | + | | | + | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

Volumes

| Name | Brookwood Blvd | | | Murphy Rd | | | Murphy Rd | | | | | |
|---|----------------|--------|--------|-----------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h] | 5 | 360 | 217 | 175 | 525 | 101 | 330 | 148 | 180 | 148 | 95 | 16 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 0.00 | 2.00 | 0.00 | 1.00 | 1.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 360 | 217 | 175 | 525 | 101 | 330 | 148 | 180 | 148 | 95 | 16 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 97 | 58 | 47 | 141 | 27 | 89 | 40 | 48 | 40 | 26 | 4 |
| Total Analysis Volume [veh/h] | 5 | 387 | 233 | 188 | 565 | 109 | 355 | 159 | 194 | 159 | 102 | 17 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

Intersection Settings

| | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|----|
| Number of Conflicting Circulating Lanes | 1 | | | 1 | | | 1 | | | 1 | | |
| Circulating Flow Rate [veh/h] | 451 | | | 526 | | | 559 | | | 1123 | | |
| Exiting Flow Rate [veh/h] | 950 | | | 752 | | | 525 | | | 273 | | |
| Demand Flow Rate [veh/h] | 5 | 360 | 217 | 175 | 525 | 101 | 330 | 148 | 180 | 148 | 95 | 16 |
| Adjusted Demand Flow Rate [veh/h] | 5 | 387 | 233 | 188 | 565 | 109 | 355 | 159 | 194 | 159 | 102 | 17 |

Lanes

| | | | | | | | | | | | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Overwrite Calculated Critical Headway | No | | | No | | | No | | | No | | |
| User-Defined Critical Headway [s] | 4.00 | | | 4.00 | | | 4.00 | | | 4.00 | | |
| Overwrite Calculated Follow-Up Time | No | | | No | | | No | | | No | | |
| User-Defined Follow-Up Time [s] | 3.00 | | | 3.00 | | | 3.00 | | | 3.00 | | |
| A (intercept) | 1380.00 | | | 1380.00 | | | 1380.00 | | | 1380.00 | | |
| B (coefficient) | 0.00102 | | | 0.00102 | | | 0.00102 | | | 0.00102 | | |
| HV Adjustment Factor | 0.99 | | | 0.99 | | | 0.98 | | | 1.00 | | |
| Entry Flow Rate [veh/h] | 633 | | | 870 | | | 719 | | | 278 | | |
| Capacity of Entry and Bypass Lanes [veh/h] | 872 | | | 807 | | | 781 | | | 440 | | |
| Pedestrian Impedance | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | |
| Capacity per Entry Lane [veh/h] | 861 | | | 800 | | | 769 | | | 440 | | |
| X, volume / capacity | 0.73 | | | 1.08 | | | 0.92 | | | 0.63 | | |

Movement, Approach, & Intersection Results

| | | | | | | | | | | | | |
|------------------------------------|--------|--|--|--------|--|--|--------|--|--|--------|--|--|
| Lane LOS | C | | | F | | | E | | | C | | |
| 95th-Percentile Queue Length [veh] | 6.51 | | | 22.27 | | | 12.94 | | | 4.27 | | |
| 95th-Percentile Queue Length [ft] | 162.87 | | | 556.80 | | | 323.49 | | | 106.77 | | |
| Approach Delay [s/veh] | 18.05 | | | 76.83 | | | 39.04 | | | 24.47 | | |
| Approach LOS | C | | | F | | | E | | | C | | |
| Intersection Delay [s/veh] | 45.27 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |

**Intersection Level Of Service Report
Intersection 9: Murphy Rd and Frontage Rd**

| | | | |
|------------------|-----------------|--------------------|------|
| Control Type: | Roundabout | Delay (sec / veh): | 12.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | | |

Intersection Setup

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|------------------------|-------------|--------|-----------|--------|-----------|--------|
| Approach | Northbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Thru | Right | Left | Thru |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | 30.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | Yes | | Yes | | Yes | |

Volumes

| Name | Frontage Rd | | Murphy Rd | | Westbound | |
|---|-------------|--------|-----------|--------|-----------|--------|
| Base Volume Input [veh/h] | 170 | 350 | 466 | 21 | 212 | 488 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 170 | 350 | 466 | 21 | 212 | 488 |
| Peak Hour Factor | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 | 0.9300 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 94 | 125 | 6 | 57 | 131 |
| Total Analysis Volume [veh/h] | 183 | 376 | 501 | 23 | 228 | 525 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

Intersection Settings

| | | | | | | |
|---|-----|-----|-----|----|-----|-----|
| Number of Conflicting Circulating Lanes | 1 | | 1 | | 1 | |
| Circulating Flow Rate [veh/h] | 506 | | 230 | | 185 | |
| Exiting Flow Rate [veh/h] | 254 | | 715 | | 886 | |
| Demand Flow Rate [veh/h] | 170 | 350 | 466 | 21 | 212 | 488 |
| Adjusted Demand Flow Rate [veh/h] | 183 | 376 | 501 | 23 | 228 | 525 |

Lanes

| | | | | | | |
|--|---------|--|---------|--|---------|--|
| Overwrite Calculated Critical Headway | No | | No | | No | |
| User-Defined Critical Headway [s] | 4.00 | | 4.00 | | 4.00 | |
| Overwrite Calculated Follow-Up Time | No | | No | | No | |
| User-Defined Follow-Up Time [s] | 3.00 | | 3.00 | | 3.00 | |
| A (intercept) | 1380.00 | | 1380.00 | | 1380.00 | |
| B (coefficient) | 0.00102 | | 0.00102 | | 0.00102 | |
| HV Adjustment Factor | 0.99 | | 0.99 | | 0.99 | |
| Entry Flow Rate [veh/h] | 565 | | 530 | | 761 | |
| Capacity of Entry and Bypass Lanes [veh/h] | 824 | | 1092 | | 1143 | |
| Pedestrian Impedance | 1.00 | | 1.00 | | 1.00 | |
| Capacity per Entry Lane [veh/h] | 816 | | 1081 | | 1132 | |
| X, volume / capacity | 0.69 | | 0.49 | | 0.67 | |

Movement, Approach, & Intersection Results

| | | | | | | |
|------------------------------------|--------|--|-------|--|--------|--|
| Lane LOS | C | | A | | B | |
| 95th-Percentile Queue Length [veh] | 5.57 | | 2.72 | | 5.36 | |
| 95th-Percentile Queue Length [ft] | 139.27 | | 67.99 | | 134.00 | |
| Approach Delay [s/veh] | 16.89 | | 8.86 | | 12.59 | |
| Approach LOS | C | | A | | B | |
| Intersection Delay [s/veh] | | | 12.83 | | | |
| Intersection LOS | | | B | | | |

Appendix D – Powers – Murphy Volumes

2040 30HV Powers Interchange and Murphy Diamond Forecasts

2040 30HV Powers Interchange and Murphy Loops + Frontage Forecasts

2040 30HV Powers Interchange and Existing Murphy Forecasts

2040 30HV Powers Overcrossing and Murphy Diamond Forecasts

2040 30HV Powers Overcrossing and Murphy Loops + Frontage Forecasts

2040 30HV Powers Interchange and Murphy Diamond Forecasts

| | | 2040 Future Volumes (Rounded) | | | | | | | | | | | | Comments |
|-------------------------------------|-----|-------------------------------|------|------|------------|------|------|-----------|-----|-----|-----------|-----|------|----------------------|
| N/S | # | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | 0 | 0 | 0 | 355 | 0 | 315 | 0 | 700 | 60 | 35 | 485 | 0 | |
| 24 US 97 NB Ramps at Powers | 24 | 35 | 0 | 30 | 0 | 0 | 0 | 220 | 835 | 0 | 0 | 485 | 110 | |
| 25 US 97 at Badger | 25 | 0 | 1560 | 0 | 0 | 1410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 26 | 0 | 1560 | 0 | 0 | 1410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 1560 | 0 | 0 | 2650 | 0 | 0 | 55 | 0 | 0 | 195 | 0 | No US 97 access |
| 53 Brookwood at Powers Rd | 53 | 5 | 370 | 190 | 445 | 560 | 40 | 65 | 70 | 5 | 365 | 80 | 190 | |
| 54 3rd at Powers | 54 | 170 | 520 | 20 | 15 | 1020 | 265 | 215 | 215 | 450 | 30 | 145 | 35 | |
| 55 Parrell Rd at Powers Rd | 55 | 60 | 265 | 0 | 0 | 345 | 155 | 130 | 0 | 120 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | 57 | 20 | 455 | 35 | 25 | 1050 | 90 | 70 | 15 | 15 | 60 | 20 | 30 | |
| 58 3rd St at Pinebrook | 58 | 95 | 375 | 10 | 55 | 995 | 35 | 15 | 0 | 35 | 5 | 0 | 30 | |
| 59 Murphy at SE 3rd St | 59 | 40 | 220 | 340 | 210 | 350 | 165 | 210 | 170 | 10 | 285 | 240 | 160 | |
| 60 Parrell Rd at China Hat Rd | 60 | 10 | 0 | 305 | 0 | 0 | 0 | 0 | 40 | 5 | 325 | 200 | 0 | Moved to account for |
| 62 Blakely Rd at Powers Rd | 62 | 20 | 5 | 105 | 25 | 5 | 45 | 10 | 630 | 65 | 145 | 570 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 5 | 415 | 170 | 160 | 545 | 55 | 65 | 45 | 5 | 315 | 45 | 120 | |
| 151 New SB Frontage at Murphy Rd | 151 | 145 | 0 | 110 | 0 | 0 | 0 | 0 | 280 | 95 | 110 | 335 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 190 | 75 | 45 | 175 | 160 | 100 | 125 | 505 | 245 | 85 | 510 | 155 | |
| 153 US 97 SB Ramps and New Intercha | 153 | 0 | 0 | 0 | 160 | 0 | 275 | 0 | 390 | 80 | 300 | 250 | 0 | |
| 154 US 97 NB Ramps and New Interca | 154 | 60 | 0 | 120 | 0 | 0 | 0 | 130 | 420 | 0 | 0 | 490 | 120 | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 165 | 0 | 50 | 10 | 710 | 0 | 0 | 635 | 165 | |
| Final Growth (2040 - 2018) | | | | | | | | | | | | | | |
| N/S | # | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Comments |
| | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | -5 | 0 | -355 | 355 | 0 | 315 | 0 | 240 | 25 | 10 | -95 | 0 | |
| 24 US 97 NB Ramps at Powers | 24 | 35 | 0 | 30 | 0 | 0 | -30 | 25 | 190 | 0 | 0 | 210 | -30 | |
| 25 US 97 at Badger | 25 | 0 | 800 | 0 | 0 | 320 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 26 | 0 | 920 | 0 | 0 | -425 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 785 | -10 | 0 | 1240 | -130 | 0 | 55 | -20 | 0 | 195 | -110 | |
| 53 Brookwood at Powers Rd | 53 | 0 | 100 | 30 | 235 | 65 | 0 | 25 | 15 | 0 | 70 | 15 | 95 | |
| 54 3rd at Powers | 54 | 75 | 145 | 10 | 0 | 365 | 60 | 35 | 85 | 115 | 15 | 65 | 20 | |
| 55 Parrell Rd at Powers Rd | 55 | 25 | 125 | 0 | 0 | 160 | 100 | 65 | 0 | 15 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | -10 | 5 | -5 | 0 | 0 | -15 | -10 | |
| 57 3rd St at Badger Rd | 57 | 0 | 160 | 10 | 0 | 295 | 0 | 5 | 0 | -5 | -5 | -5 | 5 | |
| 58 3rd St at Pinebrook | 58 | -45 | 100 | 5 | 0 | 320 | -35 | 0 | 0 | -5 | 0 | 0 | 0 | |
| 59 Murphy at SE 3rd St | 59 | 0 | 60 | 300 | 0 | 15 | 15 | 40 | 15 | 0 | 170 | 100 | 10 | |
| 60 Parrell Rd at China Hat Rd | 60 | 10 | 0 | 305 | -70 | 0 | -10 | -5 | 35 | 5 | 325 | 100 | -35 | |
| 62 Blakely Rd at Powers Rd | 62 | 5 | 5 | 45 | 5 | 5 | 35 | 5 | 245 | 35 | 45 | 135 | 50 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 0 | 75 | 10 | 0 | 50 | 0 | 15 | 5 | 0 | 80 | 0 | 0 | |
| 151 New SB Frontage at Murphy Rd | 151 | 145 | 0 | 110 | 0 | 0 | 0 | 0 | 280 | 95 | 110 | 335 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 130 | 50 | 25 | 30 | 85 | 40 | 75 | 190 | 135 | 55 | 190 | 80 | |
| 153 US 97 SB Ramps and New Intercha | 153 | 0 | 0 | 0 | 160 | 0 | 275 | 0 | 390 | 80 | 300 | 250 | 0 | |
| 154 US 97 NB Ramps and New Interca | 154 | 60 | 0 | 120 | 0 | 0 | 0 | 130 | 420 | 0 | 0 | 490 | 120 | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 85 | 0 | 0 | 0 | 310 | 0 | 0 | 280 | 80 | |

| Intersection | Count Date | Peak Hr Start | Total Vehicle Volumes | | | | | | | | | | | |
|--|------------|---------------|-----------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| Import Counts | | | | | | | | | | | | | | |
| Export | | | | | | | | | | | | | | |
| Powers Murphy | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 355 | 0 | 315 | 0 | 700 | 60 | 35 | 485 | 0 |
| 24 US 97 NB Ramps at Powers | 4/13/2017 | 4:35 PM | 35 | 0 | 30 | 0 | 0 | 0 | 220 | 835 | 0 | 0 | 485 | 110 |
| 25 US 97 at Badger | 4/13/2017 | 4:35 PM | 0 | 1560 | 0 | 0 | 1410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | 4/13/2017 | 4:35 PM | 0 | 1560 | 0 | 0 | 1410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | 4/13/2017 | 4:35 PM | 0 | 1560 | 0 | 0 | 2650 | 0 | 0 | 55 | 0 | 0 | 195 | 0 |
| 53 Brookwood at Powers Rd | 4/13/2017 | 4:30 PM | 5 | 370 | 190 | 445 | 560 | 40 | 65 | 70 | 5 | 365 | 80 | 190 |
| 54 3rd at Powers | 4/13/2017 | 4:35 PM | 170 | 520 | 20 | 15 | 1020 | 265 | 215 | 215 | 450 | 30 | 145 | 35 |
| 55 Parrell Rd at Powers Rd | 4/13/2017 | 4:35 PM | 60 | 265 | 0 | 0 | 345 | 155 | 130 | 0 | 120 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | 4/13/2017 | 4:35 PM | 20 | 455 | 35 | 25 | 1050 | 90 | 70 | 15 | 15 | 60 | 20 | 30 |
| 58 3rd St at Pinebrook | 4/13/2017 | 4:35 PM | 95 | 375 | 10 | 55 | 995 | 35 | 15 | 0 | 35 | 5 | 0 | 30 |
| 59 Murphy at SE 3rd St | 4/13/2017 | 4:30 PM | 40 | 220 | 340 | 210 | 350 | 165 | 210 | 170 | 10 | 285 | 240 | 160 |
| 60 Parrell Rd at China Hat Rd | 4/13/2017 | 4:35 PM | 10 | 0 | 305 | 0 | 0 | 0 | 0 | 40 | 5 | 325 | 200 | 0 |
| 62 Blakely Rd at Powers Rd | 4/13/2017 | 4:45 PM | 20 | 5 | 105 | 25 | 5 | 45 | 10 | 630 | 65 | 145 | 570 | 85 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 415 | 170 | 160 | 545 | 55 | 65 | 45 | 5 | 315 | 45 | 120 |
| 151 New SB Frontage at Murphy Rd | | | 145 | 0 | 110 | 0 | 0 | 0 | 0 | 280 | 95 | 110 | 335 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 190 | 75 | 45 | 175 | 160 | 100 | 125 | 505 | 245 | 85 | 510 | 155 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 160 | 0 | 275 | 0 | 390 | 80 | 300 | 250 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 60 | 0 | 120 | 0 | 0 | 0 | 130 | 420 | 0 | 0 | 490 | 120 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 165 | 0 | 50 | 10 | 710 | 0 | 0 | 635 | 165 |
| Seasonal Factor | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |
| 24 US 97 NB Ramps at Powers | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 |
| 25 US 97 at Badger | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 26 US97 at Pinebrook | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 28 US 97 at Ponderosa-China Hat | | | 1.00 | 1.30 | 1.11 | 1.00 | 1.28 | 1.11 | 1.00 | 1.00 | 1.11 | 1.00 | 1.00 | 1.06 |
| 53 Brookwood at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 54 3rd at Powers | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 55 Parrell Rd at Powers Rd | | | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.00 | 1.00 | 1.00 |
| 56 Blakely at Badger | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.06 | 1.06 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 57 3rd St at Badger Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 58 3rd St at Pinebrook | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.06 |
| 59 Murphy at SE 3rd St | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.06 |
| 60 Parrell Rd at China Hat Rd | | | 1.00 | 1.00 | 1.00 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 |
| 62 Blakely Rd at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 104 Brookwood Blvd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 151 New SB Frontage at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 152 Parrell Rd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 153 US 97 SB Ramps and New Interchange | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|--|------------|---------------|------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 154 US 97 NB Ramps and New Interchange | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 |
| 155 Murphy at Old Murphy | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| Seasonally Factored Volumes | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 462 | 0 | 410 | 0 | 742 | 78 | 46 | 514 | 0 |
| 24 US 97 NB Ramps at Powers | | | 46 | 0 | 39 | 0 | 0 | 0 | 286 | 885 | 0 | 0 | 514 | 143 |
| 25 US 97 at Badger | | | 0 | 2043 | 0 | 0 | 1848 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 2043 | 0 | 0 | 1848 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2028 | 0 | 0 | 3404 | 0 | 0 | 55 | 0 | 0 | 195 | 0 |
| 53 Brookwood at Powers Rd | | | 5 | 392 | 201 | 472 | 594 | 42 | 69 | 74 | 5 | 387 | 85 | 201 |
| 54 3rd at Powers | | | 180 | 551 | 21 | 16 | 1081 | 281 | 228 | 228 | 477 | 32 | 154 | 37 |
| 55 Parrell Rd at Powers Rd | | | 64 | 281 | 0 | 0 | 366 | 164 | 138 | 0 | 127 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 21 | 482 | 37 | 27 | 1113 | 95 | 74 | 16 | 16 | 64 | 21 | 32 |
| 58 3rd St at Pinebrook | | | 101 | 398 | 11 | 58 | 1055 | 37 | 16 | 0 | 37 | 5 | 0 | 32 |
| 59 Murphy at SE 3rd St | | | 42 | 233 | 360 | 223 | 455 | 175 | 223 | 180 | 13 | 371 | 254 | 170 |
| 60 Parrell Rd at China Hat Rd | | | 10 | 0 | 305 | 0 | 0 | 0 | 0 | 42 | 5 | 325 | 212 | 0 |
| 62 Blakely Rd at Powers Rd | | | 21 | 5 | 111 | 27 | 5 | 48 | 11 | 668 | 69 | 154 | 604 | 90 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 440 | 180 | 170 | 578 | 58 | 69 | 48 | 5 | 334 | 48 | 127 |
| 151 New SB Frontage at Murphy Rd | | | 154 | 0 | 117 | 0 | 0 | 0 | 0 | 297 | 101 | 117 | 355 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 201 | 80 | 48 | 186 | 170 | 106 | 133 | 535 | 260 | 90 | 541 | 164 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 208 | 0 | 358 | 0 | 413 | 104 | 390 | 265 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 78 | 0 | 156 | 0 | 0 | 0 | 169 | 445 | 0 | 0 | 519 | 156 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 175 | 0 | 53 | 11 | 753 | 0 | 0 | 673 | 175 |
| Balance Adjustment | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53 Brookwood at Powers Rd | | | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 1 | 0 | 33 | 9 | 14 |
| 54 3rd at Powers | | | 15 | 0 | 0 | 0 | 0 | 19 | 4 | 7 | 13 | 0 | 8 | 0 |
| 55 Parrell Rd at Powers Rd | | | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 3 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58 3rd St at Pinebrook | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 Murphy at SE 3rd St | | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 60 Parrell Rd at China Hat Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62 Blakely Rd at Powers Rd | | | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 10 | 0 | 15 | 56 | 5 |
| 104 Brookwood Blvd at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 151 New SB Frontage at Murphy Rd | | | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 14 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 34 | 0 |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|---------------|------------|------|-----|------------|------|-----|-----------|-----|-----|-----------|-----|-----|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 58 | 0 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 53 | 0 |
| Final 2040 30HV Balanced Volumes | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 462 | 0 | 410 | 0 | 742 | 78 | 46 | 514 | 0 |
| 24 US 97 NB Ramps at Powers | | | 46 | 0 | 39 | 0 | 0 | 0 | 286 | 918 | 0 | 0 | 514 | 143 |
| 25 US 97 at Badger | | | 0 | 2043 | 0 | 0 | 1848 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 2043 | 0 | 0 | 1848 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2028 | 0 | 0 | 3404 | 0 | 0 | 55 | 0 | 0 | 195 | 0 |
| 53 Brookwood at Powers Rd | | | 5 | 392 | 203 | 480 | 594 | 42 | 69 | 75 | 5 | 420 | 94 | 215 |
| 54 3rd at Powers | | | 195 | 551 | 21 | 16 | 1081 | 300 | 232 | 235 | 490 | 32 | 162 | 37 |
| 55 Parrell Rd at Powers Rd | | | 65 | 281 | 0 | 0 | 366 | 166 | 142 | 0 | 130 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 21 | 482 | 37 | 27 | 1113 | 95 | 74 | 16 | 16 | 64 | 21 | 32 |
| 58 3rd St at Pinebrook | | | 101 | 398 | 11 | 58 | 1055 | 37 | 16 | 0 | 37 | 5 | 0 | 32 |
| 59 Murphy at SE 3rd St | | | 42 | 233 | 360 | 224 | 455 | 175 | 223 | 180 | 13 | 371 | 255 | 170 |
| 60 Parrell Rd at China Hat Rd | | | 10 | 0 | 305 | 0 | 0 | 0 | 0 | 42 | 5 | 325 | 212 | 0 |
| 62 Blakely Rd at Powers Rd | | | 21 | 5 | 115 | 27 | 5 | 48 | 11 | 678 | 69 | 169 | 660 | 95 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 440 | 180 | 170 | 578 | 58 | 69 | 48 | 5 | 334 | 48 | 127 |
| 151 New SB Frontage at Murphy Rd | | | 154 | 0 | 119 | 0 | 0 | 0 | 0 | 297 | 101 | 117 | 355 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 215 | 80 | 48 | 186 | 170 | 111 | 133 | 535 | 260 | 90 | 575 | 164 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 208 | 0 | 358 | 0 | 413 | 104 | 390 | 265 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 78 | 0 | 156 | 0 | 0 | 0 | 169 | 452 | 0 | 0 | 577 | 156 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 175 | 0 | 70 | 11 | 753 | 0 | 0 | 726 | 175 |

2040 30HV Powers Interchange and Murphy Loops + Frontage Forecasts

| | | 2040 Future Volumes (Rounded) | | | | | | | | | | | | Comments |
|--------------------------------------|-----|-------------------------------|------|------|------------|-------|------|-----------|------|-----|-----------|------|------|------------------------|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| N/S | # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | 0 | 0 | 0 | 325 | 0 | 320 | 0 | 610 | 110 | 35 | 450 | 0 | |
| 23 US 97 at Powers | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | N/A, no intersection w |
| 24 US 97 NB Ramps at Powers | 24 | 35 | 0 | 30 | 0 | 0 | 0 | 220 | 715 | 0 | 0 | 450 | 100 | |
| 25 US 97 at Badger | 25 | 0 | 1560 | 0 | 0 | 1540 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 26 | 0 | 1560 | 0 | 0 | 2425 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 1255 | 0 | 0 | 1670 | 0 | 0 | 355 | 0 | 0 | 235 | 0 | No US 97 access |
| 53 Brookwood at Powers Rd | 53 | 5 | 370 | 180 | 445 | 560 | 40 | 45 | 70 | 5 | 335 | 80 | 190 | |
| 54 3rd at Powers | 54 | 155 | 520 | 20 | 15 | 920 | 265 | 215 | 200 | 330 | 30 | 145 | 35 | |
| 55 Parrell Rd at Powers Rd | 55 | 60 | 265 | 0 | 0 | 305 | 150 | 125 | 0 | 110 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | 57 | 20 | 470 | 35 | 25 | 975 | 90 | 70 | 15 | 15 | 60 | 20 | 30 | |
| 58 3rd St at Pinebrook | 58 | 95 | 390 | 10 | 55 | 920 | 35 | 15 | 0 | 40 | 5 | 0 | 30 | |
| 59 Murphy at SE 3rd St | 59 | 40 | 165 | 155 | 240 | 335 | 260 | 270 | 335 | 160 | 200 | 335 | 165 | |
| 60 Parrell Rd at China Hat Rd | 60 | 10 | 0 | 160 | 0 | 0 | 0 | 0 | 350 | 5 | 285 | 240 | 0 | Moved to account for |
| 62 Blakely Rd at Powers Rd | 62 | 20 | 5 | 75 | 25 | 5 | 45 | 10 | 620 | 65 | 145 | 540 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 5 | 445 | 160 | 160 | 605 | 55 | 160 | 80 | 15 | 280 | 95 | 170 | |
| 151 New SB Frontage at Murphy Rd | 151 | 100 | 0 | 305 | 0 | 0 | 0 | 0 | 380 | 20 | 220 | 445 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 180 | 80 | 45 | 175 | 120 | 100 | 115 | 565 | 140 | 60 | 560 | 125 | |
| 153 US 97 SB Ramps and New Interchar | 153 | 0 | 0 | 0 | 0 | 0 | 495 | 0 | 0 | 0 | 575 | 0 | 0 | |
| 154 US 97 NB Ramps and New Intercan | 154 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 575 | 385 | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 100 | 0 | 50 | 10 | 720 | 0 | 0 | 650 | 190 | |
| | | | | | | | | | | | | | 95 | |
| Final Growth (2040 - 2018) | | | | | | | | | | | | | | |
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| N/S | # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | Comments |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | -5 | 0 | -355 | 325 | 0 | 320 | 0 | 150 | 75 | 10 | -130 | 0 | |
| 23 US 97 at Powers | 23 | 0 | -830 | -20 | 0 | -1410 | -305 | 0 | -815 | 0 | 0 | -300 | 0 | |
| 24 US 97 NB Ramps at Powers | 24 | 35 | 0 | 30 | 0 | 0 | -30 | 25 | 70 | 0 | 0 | 175 | -40 | |
| 25 US 97 at Badger | 25 | 0 | 800 | 0 | 0 | 450 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 26 | 0 | 920 | 0 | 0 | 590 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 480 | -10 | 0 | 260 | -130 | 0 | 355 | -20 | 0 | 235 | -110 | |
| 53 Brookwood at Powers Rd | 53 | 0 | 100 | 20 | 235 | 65 | 0 | 5 | 15 | 0 | 40 | 15 | 95 | |
| 54 3rd at Powers | 54 | 60 | 145 | 10 | 0 | 265 | 60 | 35 | 70 | -5 | 15 | 65 | 20 | |
| 55 Parrell Rd at Powers Rd | 55 | 25 | 125 | 0 | 0 | 120 | 95 | 60 | 0 | 5 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | -10 | 5 | -5 | 0 | 0 | -15 | -10 | |
| 57 3rd St at Badger Rd | 57 | 0 | 175 | 10 | 0 | 220 | 0 | 5 | 0 | -5 | -5 | -5 | 5 | |
| 58 3rd St at Pinebrook | 58 | -45 | 115 | 5 | 0 | 245 | -35 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 59 Murphy at SE 3rd St | 59 | 0 | 5 | 115 | 30 | 0 | 110 | 100 | 180 | 150 | 85 | 195 | 15 | |
| 60 Parrell Rd at China Hat Rd | 60 | 10 | 0 | 160 | -70 | 0 | -10 | -5 | 345 | 5 | 285 | 140 | -35 | |
| 62 Blakely Rd at Powers Rd | 62 | 5 | 5 | 15 | 5 | 5 | 35 | 5 | 235 | 35 | 45 | 105 | 50 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 0 | 105 | 0 | 0 | 110 | 0 | 110 | 40 | 10 | 45 | 50 | 50 | |
| 151 New SB Frontage at Murphy Rd | 151 | 100 | 0 | 305 | 0 | 0 | 0 | 0 | 380 | 20 | 220 | 445 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 120 | 55 | 25 | 30 | 45 | 40 | 65 | 250 | 30 | 30 | 240 | 50 | |
| 153 US 97 SB Ramps and New Interchar | 153 | 0 | 0 | 0 | 0 | 0 | 495 | 0 | 0 | 0 | 575 | 0 | 0 | |
| 154 US 97 NB Ramps and New Intercan | 154 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 575 | 385 | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 320 | 0 | 0 | 295 | 105 | |

| Intersection | Count Date | Peak Hr Start | Total Vehicle Volumes | | | | | | | | | | | | |
|--|------------|---------------|-----------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|--|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Import Counts | | | | | | | | | | | | | | | |
| Export | | | | | | | | | | | | | | | |
| Powers Murphy | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 325 | 0 | 320 | 0 | 610 | 110 | 35 | 450 | 0 | |
| 24 US 97 NB Ramps at Powers | 4/13/2017 | 4:35 PM | 35 | 0 | 30 | 0 | 0 | 0 | 220 | 715 | 0 | 0 | 450 | 100 | |
| 25 US 97 at Badger | 4/13/2017 | 4:35 PM | 0 | 1560 | 0 | 0 | 1540 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 4/13/2017 | 4:35 PM | 0 | 1560 | 0 | 0 | 2425 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 4/13/2017 | 4:35 PM | 0 | 1255 | 0 | 0 | 1670 | 0 | 0 | 355 | 0 | 0 | 235 | 0 | |
| 53 Brookwood at Powers Rd | 4/13/2017 | 4:30 PM | 5 | 370 | 180 | 445 | 560 | 40 | 45 | 70 | 5 | 335 | 80 | 190 | |
| 54 3rd at Powers | 4/13/2017 | 4:35 PM | 155 | 520 | 20 | 15 | 920 | 265 | 215 | 200 | 330 | 30 | 145 | 35 | |
| 55 Parrell Rd at Powers Rd | 4/13/2017 | 4:35 PM | 60 | 265 | 0 | 0 | 305 | 150 | 125 | 0 | 110 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | 4/13/2017 | 4:35 PM | 20 | 470 | 35 | 25 | 975 | 90 | 70 | 15 | 15 | 60 | 20 | 30 | |
| 58 3rd St at Pinebrook | 4/13/2017 | 4:35 PM | 95 | 390 | 10 | 55 | 920 | 35 | 15 | 0 | 40 | 5 | 0 | 30 | |
| 59 Murphy at SE 3rd St | 4/13/2017 | 4:30 PM | 40 | 165 | 155 | 240 | 335 | 260 | 270 | 335 | 160 | 200 | 335 | 165 | |
| 60 Parrell Rd at China Hat Rd | 4/13/2017 | 4:35 PM | 10 | 0 | 160 | 0 | 0 | 0 | 0 | 350 | 5 | 285 | 240 | 0 | |
| 62 Blakely Rd at Powers Rd | 4/13/2017 | 4:45 PM | 20 | 5 | 75 | 25 | 5 | 45 | 10 | 620 | 65 | 145 | 540 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 445 | 160 | 160 | 605 | 55 | 160 | 80 | 15 | 280 | 95 | 170 | |
| 151 New SB Frontage at Murphy Rd | | | 100 | 0 | 305 | 0 | 0 | 0 | 0 | 380 | 20 | 220 | 445 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 180 | 80 | 45 | 175 | 120 | 100 | 115 | 565 | 140 | 60 | 560 | 125 | |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 575 | 385 | |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 100 | 0 | 50 | 10 | 720 | 0 | 0 | 650 | 190 | |
| Seasonal Factor | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 | |
| 24 US 97 NB Ramps at Powers | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | |
| 25 US 97 at Badger | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 26 US97 at Pinebrook | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 28 US 97 at Ponderosa-China Hat | | | 1.00 | 1.30 | 1.11 | 1.00 | 1.28 | 1.11 | 1.00 | 1.00 | 1.11 | 1.00 | 1.00 | 1.06 | |
| 53 Brookwood at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 54 3rd at Powers | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 55 Parrell Rd at Powers Rd | | | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.00 | 1.00 | 1.00 | |
| 56 Blakely at Badger | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.06 | 1.06 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 57 3rd St at Badger Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 58 3rd St at Pinebrook | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 59 Murphy at SE 3rd St | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.06 | |
| 60 Parrell Rd at China Hat Rd | | | 1.00 | 1.00 | 1.00 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | |
| 62 Blakely Rd at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 104 Brookwood Blvd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 151 New SB Frontage at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 152 Parrell Rd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 153 US 97 SB Ramps and New Interchange | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 | |

| Import Counts | | Export | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|--|-------|--------|---------------|------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|
| Intersection | Count | Date | Peak Hr Start | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 154 US 97 NB Ramps and New Interchange | | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 |
| 155 Murphy at Old Murphy | | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| Seasonally Factored Volumes | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | | 0 | 0 | 0 | 423 | 0 | 416 | 0 | 647 | 143 | 46 | 477 | 0 |
| 24 US 97 NB Ramps at Powers | | | | 46 | 0 | 39 | 0 | 0 | 0 | 286 | 758 | 0 | 0 | 477 | 130 |
| 25 US 97 at Badger | | | | 0 | 2043 | 0 | 0 | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | | 0 | 2043 | 0 | 0 | 3178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | | 0 | 1631 | 0 | 0 | 2145 | 0 | 0 | 355 | 0 | 0 | 235 | 0 |
| 53 Brookwood at Powers Rd | | | | 5 | 392 | 191 | 472 | 594 | 42 | 48 | 74 | 5 | 355 | 85 | 201 |
| 54 3rd at Powers | | | | 164 | 551 | 21 | 16 | 975 | 281 | 228 | 212 | 350 | 32 | 154 | 37 |
| 55 Parrell Rd at Powers Rd | | | | 64 | 281 | 0 | 0 | 323 | 159 | 133 | 0 | 117 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | | 21 | 498 | 37 | 27 | 1034 | 95 | 74 | 16 | 16 | 64 | 21 | 32 |
| 58 3rd St at Pinebrook | | | | 101 | 413 | 11 | 58 | 975 | 37 | 16 | 0 | 42 | 5 | 0 | 32 |
| 59 Murphy at SE 3rd St | | | | 42 | 175 | 164 | 254 | 436 | 276 | 286 | 355 | 208 | 260 | 355 | 175 |
| 60 Parrell Rd at China Hat Rd | | | | 10 | 0 | 160 | 0 | 0 | 0 | 0 | 371 | 5 | 285 | 254 | 0 |
| 62 Blakely Rd at Powers Rd | | | | 21 | 5 | 80 | 27 | 5 | 48 | 11 | 657 | 69 | 154 | 572 | 90 |
| 104 Brookwood Blvd at Murphy Rd | | | | 5 | 472 | 170 | 170 | 641 | 58 | 170 | 85 | 16 | 297 | 101 | 180 |
| 151 New SB Frontage at Murphy Rd | | | | 106 | 0 | 323 | 0 | 0 | 0 | 0 | 403 | 21 | 233 | 472 | 0 |
| 152 Parrell Rd at Murphy Rd | | | | 191 | 85 | 48 | 186 | 127 | 106 | 122 | 599 | 148 | 64 | 594 | 133 |
| 153 US 97 SB Ramps and New Interchange | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | | 0 | 0 | 267 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 610 | 501 |
| 155 Murphy at Old Murphy | | | | 0 | 0 | 0 | 106 | 0 | 53 | 11 | 763 | 0 | 0 | 689 | 201 |
| Balance Adjustment | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53 Brookwood at Powers Rd | | | | 0 | 0 | 8 | 18 | 0 | 0 | 0 | 0 | 0 | 30 | 4 | 19 |
| 54 3rd at Powers | | | | 1 | 0 | 0 | 0 | 0 | 6 | 7 | 6 | 20 | 0 | 1 | 0 |
| 55 Parrell Rd at Powers Rd | | | | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 3 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58 3rd St at Pinebrook | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 Murphy at SE 3rd St | | | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 Parrell Rd at China Hat Rd | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62 Blakely Rd at Powers Rd | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 16 | 53 | 8 |
| 104 Brookwood Blvd at Murphy Rd | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 151 New SB Frontage at Murphy Rd | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 152 Parrell Rd at Murphy Rd | | | | 9 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 16 | 0 |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|---------------|------------|------|-----|------------|------|-----|-----------|-----|-----|-----------|-----|-----|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 31 | 0 |
| Final 2040 30HV Balanced Volumes | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 423 | 0 | 416 | 0 | 647 | 143 | 46 | 477 | 0 |
| 24 US 97 NB Ramps at Powers | | | 46 | 0 | 39 | 0 | 0 | 0 | 286 | 784 | 0 | 0 | 477 | 130 |
| 25 US 97 at Badger | | | 0 | 2043 | 0 | 0 | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 2043 | 0 | 0 | 3178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 1631 | 0 | 0 | 2145 | 0 | 0 | 355 | 0 | 0 | 235 | 0 |
| 53 Brookwood at Powers Rd | | | 5 | 392 | 199 | 490 | 594 | 42 | 48 | 74 | 5 | 385 | 89 | 220 |
| 54 3rd at Powers | | | 165 | 551 | 21 | 16 | 975 | 287 | 235 | 218 | 370 | 32 | 155 | 37 |
| 55 Parrell Rd at Powers Rd | | | 64 | 281 | 0 | 0 | 323 | 160 | 135 | 0 | 120 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 21 | 498 | 37 | 27 | 1034 | 95 | 74 | 16 | 16 | 64 | 21 | 32 |
| 58 3rd St at Pinebrook | | | 101 | 413 | 11 | 58 | 975 | 37 | 16 | 0 | 42 | 5 | 0 | 32 |
| 59 Murphy at SE 3rd St | | | 42 | 175 | 164 | 255 | 436 | 276 | 286 | 355 | 208 | 260 | 355 | 175 |
| 60 Parrell Rd at China Hat Rd | | | 10 | 0 | 160 | 0 | 0 | 0 | 0 | 371 | 5 | 285 | 254 | 0 |
| 62 Blakely Rd at Powers Rd | | | 21 | 5 | 80 | 27 | 5 | 48 | 11 | 683 | 69 | 170 | 625 | 98 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 472 | 170 | 170 | 641 | 58 | 170 | 85 | 16 | 297 | 101 | 180 |
| 151 New SB Frontage at Murphy Rd | | | 106 | 0 | 323 | 0 | 0 | 0 | 0 | 404 | 21 | 233 | 472 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 200 | 85 | 48 | 186 | 127 | 111 | 122 | 599 | 148 | 64 | 610 | 133 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 267 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 610 | 501 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 106 | 0 | 70 | 11 | 763 | 0 | 0 | 720 | 201 |

2040 30HV Powers Interchange and Existing Murphy Forecasts

| | | 2040 Future Volumes (Rounded) | | | | | | | | | | | | Comments |
|-------------------------------------|-----|-------------------------------|---------|---------|------------|---------|---------|-----------|---------|---------|-----------|---------|---------|----------|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| N/S | # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | 0 | 0 | 0 | 340 | 0 | 420 | 0 | 605 | 100 | 80 | 510 | 0 | |
| 24 US 97 NB Ramps at Powers | 24 | 45 | 0 | 360 | 0 | 0 | 0 | 215 | 730 | 0 | 0 | 545 | 265 | |
| 25 US 97 at Badger | 25 | 0 | 1810 | 0 | 0 | 1390 | 0 | 0 | 0 | 10 | 0 | 0 | 275 | |
| 26 US97 at Pinebrook | 26 | 0 | 1595 | 0 | 0 | 1265 | 0 | 0 | 0 | 15 | 0 | 0 | 400 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 890 | 50 | 0 | 1770 | 140 | 0 | 0 | 35 | 0 | 0 | 710 | |
| 53 Brookwood at Powers Rd | 53 | 5 | 375 | 175 | 390 | 555 | 40 | 40 | 70 | 5 | 495 | 80 | 190 | |
| 54 3rd at Powers | 54 | 440 | 450 | 20 | 15 | 755 | 235 | 265 | 275 | 550 | 35 | 135 | 35 | |
| 55 Parrell Rd at Powers Rd | 55 | 65 | 190 | 0 | 0 | 360 | 140 | 180 | 0 | 130 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 15 | 0 | 0 | 315 | 45 | |
| 57 3rd St at Badger Rd | 57 | 20 | 720 | 35 | 30 | 1170 | 95 | 70 | 15 | 20 | 60 | 20 | 30 | |
| 58 3rd St at Pinebrook | 58 | 50 | 675 | 10 | 55 | 1055 | 70 | 15 | 0 | 40 | 5 | 0 | 30 | |
| 59 Murphy at SE 3rd St | 59 | 100 | 245 | 50 | 235 | 365 | 170 | 325 | 265 | 10 | 125 | 265 | 150 | |
| 60 Parrell Rd at China Hat Rd | 60 | 0 | 0 | 0 | 330 | 0 | 85 | 5 | 50 | 0 | 0 | 625 | 115 | |
| 62 Blakely Rd at Powers Rd | 62 | 15 | 5 | 100 | 25 | 5 | 45 | 10 | 580 | 60 | 140 | 705 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 5 | 355 | 245 | 165 | 500 | 60 | 50 | 50 | 25 | 270 | 55 | 205 | |
| 151 New SB Frontage at Murphy Rd | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 120 | 50 | 50 | 210 | 175 | 70 | 60 | 525 | 320 | 80 | 435 | 95 | |
| 153 US 97 SB Ramps and New Intercha | 153 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| 154 US 97 NB Ramps and New Interca | 154 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 365 | 0 | 50 | 10 | 540 | 0 | 0 | 490 | 135 | |
| Final Growth (2040 - 2018) | | | | | | | | | | | | | | |
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Comments |
| N/S | # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 22 | -5 | 0 | -355 | 340 | 0 | 420 | 0 | 145 | 65 | 55 | -70 | 0 | |
| 24 US 97 NB Ramps at Powers | 24 | 45 | 0 | 360 | 0 | 0 | -30 | 20 | 85 | 0 | 0 | 270 | 125 | |
| 25 US 97 at Badger | 25 | 0 | 1050 | -20 | 0 | 300 | -50 | 0 | 0 | 0 | 0 | 0 | 75 | |
| 26 US97 at Pinebrook | 26 | 0 | 955 | -60 | 0 | -495 | -75 | 0 | 0 | 10 | 0 | 0 | 130 | |
| 28 US 97 at Ponderosa-China Hat | 28 | 0 | 115 | 40 | 0 | 360 | 10 | 0 | 0 | 15 | 0 | 0 | 600 | |
| 53 Brookwood at Powers Rd | 53 | 0 | 105 | 15 | 180 | 60 | 0 | 0 | 15 | 0 | 200 | 15 | 95 | |
| 54 3rd at Powers | 54 | 345 | 75 | 10 | 0 | 100 | 30 | 85 | 145 | 215 | 20 | 55 | 20 | |
| 55 Parrell Rd at Powers Rd | 55 | 30 | 50 | 0 | 0 | 175 | 85 | 115 | 0 | 25 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 56 | 0 | 0 | 0 | 0 | 0 | -5 | -5 | 10 | 0 | 0 | 300 | 35 | |
| 57 3rd St at Badger Rd | 57 | 0 | 425 | 10 | 5 | 415 | 5 | 5 | 0 | 0 | -5 | -5 | 5 | |
| 58 3rd St at Pinebrook | 58 | -90 | 400 | 5 | 0 | 380 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 59 Murphy at SE 3rd St | 59 | 60 | 85 | 10 | 25 | 30 | 20 | 155 | 110 | 0 | 10 | 125 | 0 | |
| 60 Parrell Rd at China Hat Rd | 60 | 0 | 0 | 0 | 260 | 0 | 75 | 0 | 45 | 0 | 0 | 525 | 80 | |
| 62 Blakely Rd at Powers Rd | 62 | 0 | 5 | 40 | 5 | 5 | 35 | 5 | 195 | 30 | 40 | 270 | 50 | |
| 104 Brookwood Blvd at Murphy Rd | 104 | 0 | 15 | 85 | 5 | 5 | 5 | 0 | 10 | 20 | 35 | 10 | 85 | |
| 151 New SB Frontage at Murphy Rd | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 152 Parrell Rd at Murphy Rd | 152 | 60 | 25 | 30 | 65 | 100 | 10 | 10 | 165 | 170 | 50 | 85 | 20 | |
| 153 US 97 SB Ramps and New Intercha | 153 | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | |
| 154 US 97 NB Ramps and New Interca | 154 | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | |
| 155 Murphy at Old Murphy | 155 | 0 | 0 | 0 | 285 | 0 | 0 | 0 | 60 | 0 | 0 | 105 | 50 | |

| Intersection | Count Date | Peak Hr Start | Total Vehicle Volumes | | | | | | | | | | | | |
|--|------------|---------------|-----------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|--|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Powers Murphy | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 340 | 0 | 420 | 0 | 605 | 100 | 80 | 510 | 0 | |
| 24 US 97 NB Ramps at Powers | 4/13/2017 | 4:35 PM | 45 | 0 | 360 | 0 | 0 | 0 | 215 | 730 | 0 | 0 | 545 | 265 | |
| 25 US 97 at Badger | 4/13/2017 | 4:35 PM | 0 | 1810 | 0 | 0 | 1390 | 0 | 0 | 0 | 10 | 0 | 0 | 275 | |
| 26 US97 at Pinebrook | 4/13/2017 | 4:35 PM | 0 | 1595 | 0 | 0 | 1265 | 0 | 0 | 0 | 15 | 0 | 0 | 400 | |
| 28 US 97 at Ponderosa-China Hat | 4/13/2017 | 4:35 PM | 0 | 890 | 50 | 0 | 1770 | 140 | 0 | 0 | 35 | 0 | 0 | 710 | |
| 53 Brookwood at Powers Rd | 4/13/2017 | 4:30 PM | 5 | 375 | 175 | 390 | 555 | 40 | 40 | 70 | 5 | 495 | 80 | 190 | |
| 54 3rd at Powers | 4/13/2017 | 4:35 PM | 440 | 450 | 20 | 15 | 755 | 235 | 265 | 275 | 550 | 35 | 135 | 35 | |
| 55 Parrell Rd at Powers Rd | 4/13/2017 | 4:35 PM | 65 | 190 | 0 | 0 | 360 | 140 | 180 | 0 | 130 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 15 | 0 | 0 | 315 | 45 | |
| 57 3rd St at Badger Rd | 4/13/2017 | 4:35 PM | 20 | 720 | 35 | 30 | 1170 | 95 | 70 | 15 | 20 | 60 | 20 | 30 | |
| 58 3rd St at Pinebrook | 4/13/2017 | 4:35 PM | 50 | 675 | 10 | 55 | 1055 | 70 | 15 | 0 | 40 | 5 | 0 | 30 | |
| 59 Murphy at SE 3rd St | 4/13/2017 | 4:30 PM | 100 | 245 | 50 | 235 | 365 | 170 | 325 | 265 | 10 | 125 | 265 | 150 | |
| 60 Parrell Rd at China Hat Rd | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 330 | 0 | 85 | 5 | 50 | 0 | 0 | 625 | 115 | |
| 62 Blakely Rd at Powers Rd | 4/13/2017 | 4:45 PM | 15 | 5 | 100 | 25 | 5 | 45 | 10 | 580 | 60 | 140 | 705 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 355 | 245 | 165 | 500 | 60 | 50 | 50 | 25 | 270 | 55 | 205 | |
| 151 New SB Frontage at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 120 | 50 | 50 | 210 | 175 | 70 | 60 | 525 | 320 | 80 | 435 | 95 | |
| 153 US 97 SB Ramps and New Interchange | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| 154 US 97 NB Ramps and New Interchange | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 365 | 0 | 50 | 10 | 540 | 0 | 0 | 490 | 135 | |
| Seasonal Factor | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 | |
| 24 US 97 NB Ramps at Powers | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | |
| 25 US 97 at Badger | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 26 US97 at Pinebrook | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 28 US 97 at Ponderosa-China Hat | | | 1.00 | 1.30 | 1.11 | 1.00 | 1.28 | 1.11 | 1.00 | 1.00 | 1.11 | 1.00 | 1.00 | 1.06 | |
| 53 Brookwood at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 54 3rd at Powers | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 55 Parrell Rd at Powers Rd | | | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.00 | 1.00 | 1.00 | |
| 56 Blakely at Badger | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.06 | 1.06 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| 57 3rd St at Badger Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 58 3rd St at Pinebrook | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 59 Murphy at SE 3rd St | | | 1.30 | 1.30 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.06 | |
| 60 Parrell Rd at China Hat Rd | | | 1.00 | 1.00 | 1.00 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | |
| 62 Blakely Rd at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 104 Brookwood Blvd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 151 New SB Frontage at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 152 Parrell Rd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| 153 US 97 SB Ramps and New Interchange | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 | |
| 154 US 97 NB Ramps and New Interchange | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | |
| 155 Murphy at Old Murphy | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |

| Import Counts | | Export | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|---------------|---------|------------|-------|-------|------------|-------|-------|-----------|-------|-------|-----------|-------|--|
| Intersection | Count Date | Peak Hr Start | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Seasonally Factored Volumes | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 442 | 0 | 546 | 0 | 641 | 130 | 104 | 541 | 0 | |
| 24 US 97 NB Ramps at Powers | | | 59 | 0 | 468 | 0 | 0 | 0 | 280 | 774 | 0 | 0 | 578 | 345 | |
| 25 US 97 at Badger | | | 0 | 2371 | 0 | 0 | 1821 | 0 | 0 | 0 | 10 | 0 | 0 | 275 | |
| 26 US97 at Pinebrook | | | 0 | 2089 | 0 | 0 | 1658 | 0 | 0 | 0 | 15 | 0 | 0 | 400 | |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 1157 | 56 | 0 | 2274 | 155 | 0 | 0 | 39 | 0 | 0 | 753 | |
| 53 Brookwood at Powers Rd | | | 5 | 398 | 186 | 413 | 588 | 42 | 42 | 74 | 5 | 525 | 85 | 201 | |
| 54 3rd at Powers | | | 466 | 477 | 21 | 16 | 800 | 249 | 281 | 292 | 583 | 37 | 143 | 37 | |
| 55 Parrell Rd at Powers Rd | | | 69 | 201 | 0 | 0 | 382 | 148 | 191 | 0 | 138 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 27 | 27 | 15 | 0 | 0 | 315 | 45 | |
| 57 3rd St at Badger Rd | | | 21 | 763 | 37 | 32 | 1240 | 101 | 74 | 16 | 21 | 64 | 21 | 32 | |
| 58 3rd St at Pinebrook | | | 53 | 716 | 11 | 58 | 1118 | 74 | 16 | 0 | 42 | 5 | 0 | 32 | |
| 59 Murphy at SE 3rd St | | | 130 | 319 | 65 | 249 | 475 | 180 | 345 | 281 | 13 | 163 | 281 | 159 | |
| 60 Parrell Rd at China Hat Rd | | | 0 | 0 | 0 | 350 | 0 | 90 | 5 | 53 | 0 | 0 | 663 | 122 | |
| 62 Blakely Rd at Powers Rd | | | 16 | 5 | 106 | 27 | 5 | 48 | 11 | 615 | 64 | 148 | 747 | 90 | |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 376 | 260 | 175 | 530 | 64 | 53 | 53 | 27 | 286 | 58 | 217 | |
| 151 New SB Frontage at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 127 | 53 | 53 | 223 | 186 | 74 | 64 | 557 | 339 | 85 | 461 | 101 | |
| 153 US 97 SB Ramps and New Interchange | | | #VALUE! | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | |
| 154 US 97 NB Ramps and New Intercange | | | #VALUE! | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 387 | 0 | 53 | 11 | 572 | 0 | 0 | 519 | 143 | |
| Balance Adjustment | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | | | | | | | | | | | | | |
| 24 US 97 NB Ramps at Powers | | | | | | | | | | 29 | | | 9 | | |
| 25 US 97 at Badger | | | | | | | | | | | | | | | |
| 26 US97 at Pinebrook | | | | | | | | | | | | | | | |
| 28 US 97 at Ponderosa-China Hat | | | | | 2 | | | | | | | | | | |
| 53 Brookwood at Powers Rd | | | | | 13 | 22 | | | | 2 | | 50 | 8 | 20 | |
| 54 3rd at Powers | | | 40 | | | | | 25 | 29 | 29 | 57 | | 8 | | |
| 55 Parrell Rd at Powers Rd | | | | | | | | | | | | | | | |
| 56 Blakely at Badger | | | | | | | | | | | | | | | |
| 57 3rd St at Badger Rd | | | | | | | | | | | | | | | |
| 58 3rd St at Pinebrook | | | | | | | | | | | | | | | |
| 59 Murphy at SE 3rd St | | | | | | | | | | | | | | | |
| 60 Parrell Rd at China Hat Rd | | | | | | | | | | | | | | | |
| 62 Blakely Rd at Powers Rd | | | | | 4 | | | | | 20 | | 15 | 78 | 9 | |
| 104 Brookwood Blvd at Murphy Rd | | | | | | | | | | | | | | | |
| 151 New SB Frontage at Murphy Rd | | | | | | | | | | | | | | | |
| 152 Parrell Rd at Murphy Rd | | | 6 | | | | | 4 | | 6 | 5 | | 20 | | |
| 153 US 97 SB Ramps and New Interchange | | | | | | | | | | | | | | | |
| 154 US 97 NB Ramps and New Intercange | | | | | | | | | | | | | | | |
| 155 Murphy at Old Murphy | | | | | | | | | | 12 | | | 30 | | |
| Final 2040 30HV Balanced Volumes | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 442 | 0 | 546 | 0 | 641 | 130 | 104 | 541 | 0 | |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|--|------------|---------------|------------|------|-----|------------|------|-----|-----------|-----|-----|-----------|-----|-----|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 24 US 97 NB Ramps at Powers | | | 59 | 0 | 468 | 0 | 0 | 0 | 280 | 803 | 0 | 0 | 587 | 345 |
| 25 US 97 at Badger | | | 0 | 2371 | 0 | 0 | 1821 | 0 | 0 | 0 | 10 | 0 | 0 | 275 |
| 26 US97 at Pinebrook | | | 0 | 2089 | 0 | 0 | 1658 | 0 | 0 | 0 | 15 | 0 | 0 | 400 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 1157 | 58 | 0 | 2274 | 155 | 0 | 0 | 39 | 0 | 0 | 753 |
| 53 Brookwood at Powers Rd | | | 5 | 398 | 199 | 435 | 588 | 42 | 42 | 76 | 5 | 575 | 93 | 221 |
| 54 3rd at Powers | | | 506 | 477 | 21 | 16 | 800 | 274 | 310 | 321 | 640 | 37 | 151 | 37 |
| 55 Parrell Rd at Powers Rd | | | 69 | 201 | 0 | 0 | 382 | 148 | 191 | 0 | 138 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 27 | 27 | 15 | 0 | 0 | 315 | 45 |
| 57 3rd St at Badger Rd | | | 21 | 763 | 37 | 32 | 1240 | 101 | 74 | 16 | 21 | 64 | 21 | 32 |
| 58 3rd St at Pinebrook | | | 53 | 716 | 11 | 58 | 1118 | 74 | 16 | 0 | 42 | 5 | 0 | 32 |
| 59 Murphy at SE 3rd St | | | 130 | 319 | 65 | 249 | 475 | 180 | 345 | 281 | 13 | 163 | 281 | 159 |
| 60 Parrell Rd at China Hat Rd | | | 0 | 0 | 0 | 350 | 0 | 90 | 5 | 53 | 0 | 0 | 663 | 122 |
| 62 Blakely Rd at Powers Rd | | | 16 | 5 | 110 | 27 | 5 | 48 | 11 | 635 | 64 | 163 | 825 | 99 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 376 | 260 | 175 | 530 | 64 | 53 | 53 | 27 | 286 | 58 | 217 |
| 151 New SB Frontage at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 133 | 53 | 53 | 223 | 186 | 78 | 64 | 563 | 344 | 85 | 481 | 101 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 387 | 0 | 53 | 11 | 584 | 0 | 0 | 549 | 143 |

2040 30HV Powers Overcrossing and Murphy Diamond Forecasts

| | | 2040 Future Volumes (Rounded) | | | | | | | | | | | | Comments |
|--|-------|-------------------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|-----------------------------------|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| N/S | E # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 0 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No ramps in Bundle A |
| 24 US 97 NB Ramps at Powers | 0 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No ramps in Bundle A |
| 25 US 97 at Badger | 0 25 | 0 | 1460 | 0 | 0 | 1685 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 0 26 | 0 | 1460 | 0 | 0 | 1685 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 0 28 | 0 | 1720 | 0 | 0 | 2745 | 0 | 0 | 420 | 15 | 0 | 320 | 0 | No US 97 access |
| 53 Brookwood at Powers Rd | 0 53 | 5 | 455 | 130 | 410 | 610 | 55 | 55 | 60 | 5 | 180 | 70 | 105 | |
| 54 3rd at Powers | 0 54 | 95 | 580 | 10 | 15 | 1095 | 295 | 300 | 175 | 200 | 20 | 55 | 75 | |
| 55 Parrell Rd at Powers Rd | 0 55 | 60 | 310 | 0 | 0 | 395 | 90 | 115 | 0 | 105 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 0 56 | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 | Not shown in Visum model |
| 57 3rd St at Badger Rd | 0 57 | 20 | 465 | 35 | 30 | 995 | 90 | 70 | 15 | 20 | 70 | 25 | 30 | Not shown in Visum model |
| 58 3rd St at Pinebrook | 0 58 | 90 | 495 | 5 | 55 | 975 | 40 | 20 | 0 | 45 | 5 | 5 | 30 | Not shown in Visum model |
| 59 Murphy at SE 3rd St | 0 59 | 40 | 230 | 340 | 210 | 365 | 150 | 220 | 170 | 10 | 285 | 245 | 160 | |
| 60 Parrell Rd at China Hat Rd | 0 60 | 80 | 0 | 260 | 0 | 0 | 0 | 0 | 110 | 75 | 310 | 235 | 0 | Moved to account for NB instead c |
| 62 Blakely Rd at Powers Rd | 0 62 | 90 | 25 | 110 | 20 | 5 | 45 | 10 | 535 | 65 | 125 | 225 | 80 | |
| 104 Brookwood Blvd at Murphy Rd | 0 104 | 5 | 340 | 210 | 170 | 495 | 75 | 50 | 50 | 5 | 325 | 115 | 160 | |
| 151 New SB Frontage at Murphy Rd | 0 151 | 275 | 0 | 125 | 0 | 0 | 0 | 0 | 275 | 155 | 110 | 325 | 0 | |
| 152 Parrell Rd at Murphy Rd | 0 152 | 240 | 90 | 45 | 175 | 175 | 105 | 125 | 505 | 255 | 140 | 460 | 135 | |
| 153 US 97 SB Ramps and New Interchange | 0 153 | 0 | 0 | 0 | 245 | 0 | 330 | 0 | 365 | 80 | 300 | 200 | 0 | |
| 154 US 97 NB Ramps and New Intercange | 0 154 | 60 | 0 | 130 | 0 | 0 | 0 | 210 | 400 | 0 | 0 | 440 | 140 | |
| 155 Murphy at Old Murphy | 0 155 | 0 | 0 | 0 | 125 | 0 | 50 | 10 | 710 | 0 | 0 | 630 | 165 | |
| Final Growth (2040 - 2018) | | | | | | | | | | | | | | |
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Comments |
| N/S | E # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 0 22 | -5 | 0 | -355 | 0 | 0 | 0 | 0 | -460 | -35 | -25 | -580 | 0 | OK, geomety changes nearby |
| 24 US 97 NB Ramps at Powers | 0 24 | 0 | 0 | 0 | 0 | 0 | -30 | -195 | -645 | 0 | 0 | -275 | -140 | |
| 25 US 97 at Badger | 0 25 | 0 | 700 | 0 | 0 | 595 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 0 26 | 0 | 820 | 0 | 0 | 645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 0 28 | 0 | 945 | -10 | 0 | 1335 | -130 | 0 | 420 | -5 | 0 | 320 | -110 | OK, model shows decrease |
| 53 Brookwood at Powers Rd | 0 53 | 0 | 185 | -30 | 200 | 115 | 15 | 5 | 0 | 0 | -115 | 5 | 10 | Reduced WBL and NBR due to rei |
| 54 3rd at Powers | 0 54 | 0 | 205 | 0 | 0 | 440 | 90 | 120 | 45 | -135 | 5 | -25 | 60 | |
| 55 Parrell Rd at Powers Rd | 0 55 | 25 | 170 | 0 | 0 | 210 | 35 | 50 | 0 | 0 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 0 56 | 0 | 0 | 0 | 0 | 0 | -10 | 5 | -5 | 0 | 0 | -15 | -10 | OK, model shows decrease |
| 57 3rd St at Badger Rd | 0 57 | 0 | 170 | 10 | 5 | 240 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | OK, road stubs |
| 58 3rd St at Pinebrook | 0 58 | -50 | 220 | 0 | 0 | 300 | -30 | 0 | 0 | 0 | 0 | 5 | 0 | OK, model shows decrease |
| 59 Murphy at SE 3rd St | 0 59 | 0 | 70 | 300 | 0 | 30 | 0 | 50 | 15 | 0 | 170 | 105 | 10 | |
| 60 Parrell Rd at China Hat Rd | 0 60 | 70 | 0 | 190 | 0 | 0 | 0 | 0 | 105 | 70 | 275 | 135 | 0 | |
| 62 Blakely Rd at Powers Rd | 0 62 | 75 | 25 | 50 | 0 | 5 | 35 | 5 | 150 | 35 | 25 | -210 | 45 | Volume reduction due to removal c |
| 104 Brookwood Blvd at Murphy Rd | 0 104 | 0 | 0 | 50 | 10 | 0 | 20 | 0 | 10 | 0 | 90 | 70 | 40 | |
| 151 New SB Frontage at Murphy Rd | 0 151 | 275 | 0 | 125 | 0 | 0 | 0 | 0 | 275 | 155 | 110 | 325 | 0 | |
| 152 Parrell Rd at Murphy Rd | 0 152 | 180 | 65 | 25 | 30 | 100 | 45 | 75 | 190 | 145 | 110 | 140 | 60 | |
| 153 US 97 SB Ramps and New Interchange | 0 153 | 0 | 0 | 0 | 245 | 0 | 330 | 0 | 365 | 80 | 300 | 200 | 0 | |
| 154 US 97 NB Ramps and New Intercange | 0 154 | 60 | 0 | 130 | 0 | 0 | 0 | 210 | 400 | 0 | 0 | 440 | 140 | |
| 155 Murphy at Old Murphy | 0 155 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 310 | 0 | 0 | 275 | 80 | |

| Intersection | Count Date | Peak Hr Start | Total Vehicle Volumes | | | | | | | | | | | |
|--|------------|---------------|-----------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| Import Counts | | | | | | | | | | | | | | |
| Export | | | | | | | | | | | | | | |
| Powers Murphy | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | 4/13/2017 | 4:35 PM | 0 | 1460 | 0 | 0 | 1685 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | 4/13/2017 | 4:35 PM | 0 | 1460 | 0 | 0 | 1685 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | 4/13/2017 | 4:35 PM | 0 | 1720 | 0 | 0 | 2745 | 0 | 0 | 420 | 0 | 0 | 320 | 0 |
| 53 Brookwood at Powers Rd | 4/13/2017 | 4:30 PM | 5 | 455 | 130 | 410 | 610 | 55 | 55 | 60 | 5 | 180 | 70 | 105 |
| 54 3rd at Powers | 4/13/2017 | 4:35 PM | 95 | 580 | 10 | 15 | 1095 | 295 | 300 | 175 | 200 | 20 | 55 | 75 |
| 55 Parrell Rd at Powers Rd | 4/13/2017 | 4:35 PM | 60 | 310 | 0 | 0 | 395 | 90 | 115 | 0 | 105 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | 4/13/2017 | 4:35 PM | 20 | 465 | 35 | 30 | 995 | 90 | 70 | 15 | 20 | 70 | 25 | 30 |
| 58 3rd St at Pinebrook | 4/13/2017 | 4:35 PM | 90 | 495 | 5 | 55 | 975 | 40 | 20 | 0 | 45 | 5 | 5 | 30 |
| 59 Murphy at SE 3rd St | 4/13/2017 | 4:30 PM | 40 | 230 | 340 | 210 | 365 | 150 | 220 | 170 | 10 | 285 | 245 | 160 |
| 60 Parrell Rd at China Hat Rd | 4/13/2017 | 4:35 PM | 80 | 0 | 260 | 0 | 0 | 0 | 0 | 110 | 75 | 310 | 235 | 0 |
| 62 Blakely Rd at Powers Rd | 4/13/2017 | 4:45 PM | 90 | 25 | 110 | 20 | 5 | 45 | 10 | 535 | 65 | 125 | 225 | 80 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 340 | 210 | 170 | 495 | 75 | 50 | 50 | 5 | 325 | 115 | 160 |
| 151 New SB Frontage at Murphy Rd | | | 275 | 0 | 125 | 0 | 0 | 0 | 0 | 275 | 155 | 110 | 325 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 240 | 90 | 45 | 175 | 175 | 105 | 125 | 505 | 255 | 140 | 460 | 135 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 245 | 0 | 330 | 0 | 365 | 80 | 300 | 200 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 60 | 0 | 130 | 0 | 0 | 0 | 210 | 400 | 0 | 0 | 440 | 140 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 125 | 0 | 50 | 10 | 710 | 0 | 0 | 630 | 165 |
| Seasonal Factor | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |
| 24 US 97 NB Ramps at Powers | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 |
| 25 US 97 at Badger | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 26 US97 at Pinebrook | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 28 US 97 at Ponderosa-China Hat | | | 1.00 | 1.30 | 1.11 | 1.00 | 1.28 | 1.11 | 1.00 | 1.00 | 1.11 | 1.00 | 1.00 | 1.06 |
| 53 Brookwood at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 54 3rd at Powers | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 55 Parrell Rd at Powers Rd | | | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.00 | 1.00 | 1.00 |
| 56 Blakely at Badger | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.06 | 1.06 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 57 3rd St at Badger Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 58 3rd St at Pinebrook | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.06 |
| 59 Murphy at SE 3rd St | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.06 |
| 60 Parrell Rd at China Hat Rd | | | 1.00 | 1.00 | 1.00 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 |
| 62 Blakely Rd at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 104 Brookwood Blvd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 151 New SB Frontage at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 152 Parrell Rd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 153 US 97 SB Ramps and New Interchange | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |

| Import Counts | | Export | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|--|------------|---------------|------|------------|------|------|------------|------|------|-----------|------|------|-----------|------|--|
| Intersection | Count Date | Peak Hr Start | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| 154 US 97 NB Ramps and New Interchange | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | |
| 155 Murphy at Old Murphy | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| Seasonally Factored Volumes | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 25 US 97 at Badger | | | 0 | 1912 | 0 | 0 | 2208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | | | 0 | 1912 | 0 | 0 | 2208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2236 | 0 | 0 | 3526 | 0 | 0 | 420 | 0 | 0 | 320 | 0 | |
| 53 Brookwood at Powers Rd | | | 5 | 482 | 138 | 435 | 647 | 58 | 58 | 64 | 5 | 191 | 74 | 111 | |
| 54 3rd at Powers | | | 101 | 615 | 11 | 16 | 1161 | 313 | 318 | 186 | 212 | 21 | 58 | 80 | |
| 55 Parrell Rd at Powers Rd | | | 64 | 329 | 0 | 0 | 419 | 95 | 122 | 0 | 111 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | | | 21 | 493 | 37 | 32 | 1055 | 95 | 74 | 16 | 21 | 74 | 27 | 32 | |
| 58 3rd St at Pinebrook | | | 95 | 525 | 5 | 58 | 1034 | 42 | 21 | 0 | 48 | 5 | 5 | 32 | |
| 59 Murphy at SE 3rd St | | | 42 | 244 | 360 | 223 | 475 | 159 | 233 | 180 | 13 | 371 | 260 | 170 | |
| 60 Parrell Rd at China Hat Rd | | | 80 | 0 | 260 | 0 | 0 | 0 | 0 | 117 | 75 | 310 | 249 | 0 | |
| 62 Blakely Rd at Powers Rd | | | 95 | 27 | 117 | 21 | 5 | 48 | 11 | 567 | 69 | 133 | 239 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 360 | 223 | 180 | 525 | 80 | 53 | 53 | 5 | 345 | 122 | 170 | |
| 151 New SB Frontage at Murphy Rd | | | 292 | 0 | 133 | 0 | 0 | 0 | 0 | 292 | 164 | 117 | 345 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 254 | 95 | 48 | 186 | 186 | 111 | 133 | 535 | 270 | 148 | 488 | 143 | |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 319 | 0 | 429 | 0 | 387 | 104 | 390 | 212 | 0 | |
| 154 US 97 NB Ramps and New Interchange | | | 78 | 0 | 169 | 0 | 0 | 0 | 273 | 424 | 0 | 0 | 466 | 182 | |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 133 | 0 | 53 | 11 | 753 | 0 | 0 | 668 | 175 | |
| Balance Adjustment | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 25 US 97 at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 53 Brookwood at Powers Rd | | | 0 | 0 | 7 | 20 | 0 | 0 | 0 | 1 | 0 | 14 | 0 | 3 | |
| 54 3rd at Powers | | | 0 | 0 | 9 | 4 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 1 | |
| 55 Parrell Rd at Powers Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| 58 3rd St at Pinebrook | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 59 Murphy at SE 3rd St | | | 0 | 0 | 15 | 11 | 1 | 1 | 0 | 10 | 0 | 1 | 0 | 0 | |
| 60 Parrell Rd at China Hat Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 62 Blakely Rd at Powers Rd | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 5 | 12 | 0 | |
| 104 Brookwood Blvd at Murphy Rd | | | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | |
| 151 New SB Frontage at Murphy Rd | | | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 16 | 0 | 0 | 1 | 1 | 5 | 1 | 0 | 0 | 0 | -68 | 0 | |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|---------------|------------|------|-----|------------|------|-----|-----------|-----|-----|-----------|-----|-----|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 58 | 0 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 18 | 0 | 17 | 0 | 35 | 0 | 0 | 63 | 0 |
| Final 2040 30HV Balanced Volumes | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | | | 0 | 1912 | 0 | 0 | 2208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 1912 | 0 | 0 | 2208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2236 | 0 | 0 | 3526 | 0 | 0 | 420 | 0 | 0 | 320 | 0 |
| 53 Brookwood at Powers Rd | | | 5 | 482 | 145 | 455 | 647 | 58 | 58 | 65 | 5 | 205 | 74 | 114 |
| 54 3rd at Powers | | | 101 | 615 | 20 | 20 | 1161 | 313 | 318 | 198 | 212 | 21 | 58 | 80 |
| 55 Parrell Rd at Powers Rd | | | 64 | 329 | 0 | 0 | 419 | 95 | 122 | 0 | 111 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 21 | 493 | 37 | 32 | 1055 | 95 | 74 | 16 | 21 | 74 | 27 | 32 |
| 58 3rd St at Pinebrook | | | 95 | 525 | 5 | 58 | 1034 | 42 | 21 | 0 | 48 | 5 | 5 | 32 |
| 59 Murphy at SE 3rd St | | | 42 | 244 | 375 | 234 | 475 | 160 | 233 | 190 | 13 | 371 | 260 | 170 |
| 60 Parrell Rd at China Hat Rd | | | 80 | 0 | 260 | 0 | 0 | 0 | 0 | 117 | 75 | 310 | 249 | 0 |
| 62 Blakely Rd at Powers Rd | | | 95 | 27 | 117 | 21 | 5 | 48 | 11 | 585 | 69 | 137 | 250 | 85 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 360 | 225 | 180 | 525 | 80 | 53 | 55 | 5 | 345 | 122 | 170 |
| 151 New SB Frontage at Murphy Rd | | | 292 | 0 | 140 | 0 | 0 | 0 | 0 | 292 | 164 | 117 | 345 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 270 | 95 | 48 | 186 | 186 | 116 | 133 | 535 | 270 | 148 | 420 | 143 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 319 | 0 | 429 | 0 | 387 | 104 | 390 | 212 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 78 | 0 | 169 | 0 | 0 | 0 | 273 | 433 | 0 | 0 | 524 | 182 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 150 | 0 | 70 | 11 | 788 | 0 | 0 | 731 | 175 |

2040 30HV Powers Overcrossing and Murphy Loops + Frontage Forecasts

| | | 2040 Future Volumes (Rounded) | | | | | | | | | | | | Comments |
|--|-------|-------------------------------|------|-------|------------|------|------|-----------|------|-------|-----------|------|------|-----------------------------------|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | |
| N/S | E # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 0 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No ramps in Bundle A |
| 23 US 97 at Powers | 0 23 | 0 | 1460 | 0 | 0 | 1745 | 0 | 0 | 645 | 0 | 0 | 415 | 0 | Overcrossing, no turns |
| 24 US 97 NB Ramps at Powers | 0 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No ramps in Bundle A |
| 25 US 97 at Badger | 0 25 | 0 | 1460 | 0 | 0 | 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 0 26 | 0 | 1460 | 0 | 0 | 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 0 28 | 0 | 1705 | 0 | 0 | 2410 | 0 | 0 | 420 | 0 | 0 | 320 | 0 | No US 97 access |
| 53 Brookwood at Powers Rd | 0 53 | 5 | 445 | 120 | 430 | 580 | 55 | 55 | 60 | 5 | 180 | 70 | 110 | |
| 54 3rd at Powers | 0 54 | 65 | 580 | 10 | 15 | 1055 | 295 | 300 | 175 | 170 | 20 | 55 | 75 | |
| 55 Parrell Rd at Powers Rd | 0 55 | 60 | 310 | 0 | 0 | 355 | 90 | 115 | 0 | 85 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 0 56 | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 | Not shown in Visum model |
| 57 3rd St at Badger Rd | 0 57 | 20 | 435 | 35 | 30 | 925 | 90 | 70 | 15 | 15 | 70 | 20 | 30 | Not shown in Visum model |
| 58 3rd St at Pinebrook | 0 58 | 90 | 465 | 5 | 55 | 905 | 40 | 15 | 0 | 40 | 5 | 5 | 30 | Not shown in Visum model |
| 59 Murphy at SE 3rd St | 0 59 | 45 | 160 | 155 | 210 | 355 | 255 | 275 | 330 | 240 | 220 | 335 | 160 | |
| 60 Parrell Rd at China Hat Rd | 0 60 | 50 | 0 | 140 | 0 | 0 | 0 | 0 | 390 | 30 | 275 | 270 | 0 | Moved to account for NB instead c |
| 62 Blakely Rd at Powers Rd | 0 62 | 90 | 25 | 70 | 20 | 5 | 45 | 10 | 535 | 65 | 110 | 225 | 80 | |
| 104 Brookwood Blvd at Murphy Rd | 0 104 | 5 | 340 | 205 | 165 | 495 | 95 | 140 | 90 | 15 | 310 | 140 | 170 | |
| 151 New SB Frontage at Murphy Rd | 0 151 | 160 | 0 | 330 | 0 | 0 | 0 | 0 | 440 | 20 | 200 | 460 | 0 | |
| 152 Parrell Rd at Murphy Rd | 0 152 | 180 | 90 | 45 | 175 | 135 | 105 | 125 | 505 | 135 | 60 | 540 | 135 | |
| 153 US 97 SB Ramps and New Interchange | 0 153 | 0 | 0 | 0 | 0 | 0 | 675 | 0 | 0 | 0 | 390 | 0 | 0 | |
| 154 US 97 NB Ramps and New Interchange | 0 154 | 0 | 360 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 390 | 425 | |
| 155 Murphy at Old Murphy | 0 155 | 0 | 0 | 0 | 80 | 0 | 50 | 10 | 685 | 0 | 0 | 665 | 160 | |
| Final Growth (2040 - 2018) | | | | | | | | | | | | | | |
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Comments |
| N/S | E # | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| Study Intersections | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 0 22 | -5 | 0 | -355 | 0 | 0 | 0 | 0 | -460 | -35 | -25 | -580 | 0 | OK, geomety changes nearby |
| 24 US 97 NB Ramps at Powers | 0 24 | 0 | 0 | 0 | 0 | 0 | -30 | -195 | -645 | 0 | 0 | -275 | -140 | |
| 25 US 97 at Badger | 0 25 | 0 | 700 | 0 | 0 | 655 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | 0 26 | 0 | 820 | 0 | 0 | 705 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | 0 28 | 0 | 930 | -10 | 0 | 1000 | -130 | 0 | 420 | -20 | 0 | 320 | -110 | OK, model shows decrease |
| 53 Brookwood at Powers Rd | 0 53 | 0 | 175 | -40 | 220 | 85 | 15 | 15 | 5 | 0 | -115 | 5 | 15 | Model shows growth |
| 54 3rd at Powers | 0 54 | -30 | 205 | 0 | 0 | 400 | 90 | 120 | 45 | -165 | 5 | -25 | 60 | |
| 55 Parrell Rd at Powers Rd | 0 55 | 25 | 170 | 0 | 0 | 170 | 35 | 50 | 0 | -20 | 0 | 0 | 0 | |
| 56 Blakely at Badger | 0 56 | 0 | 0 | 0 | 0 | 0 | -10 | 5 | -5 | 0 | 0 | -15 | -10 | OK, model shows decrease |
| 57 3rd St at Badger Rd | 0 57 | 0 | 140 | 10 | 5 | 170 | 0 | 5 | 0 | -5 | 5 | -5 | 5 | OK, road stubs |
| 58 3rd St at Pinebrook | 0 58 | -50 | 190 | 0 | 0 | 230 | -30 | -5 | 0 | 0 | 0 | 5 | 0 | OK, model shows decrease |
| 59 Murphy at SE 3rd St | 0 59 | 5 | 0 | 115 | 0 | 20 | 105 | 105 | 175 | 230 | 105 | 195 | 10 | |
| 60 Parrell Rd at China Hat Rd | 0 60 | #REF! | 0 | #REF! | 70 | 0 | 40 | 25 | 385 | #REF! | #REF! | 170 | 240 | |
| 62 Blakely Rd at Powers Rd | 0 62 | 75 | 25 | 10 | 0 | 5 | 35 | 5 | 150 | 35 | 10 | -210 | 45 | |
| 104 Brookwood Blvd at Murphy Rd | 0 104 | 0 | 0 | 45 | 5 | 0 | 40 | 90 | 50 | 10 | 75 | 95 | 50 | |
| 151 New SB Frontage at Murphy Rd | 0 151 | 160 | 0 | 330 | 0 | 0 | 0 | 0 | 440 | 20 | 200 | 460 | 0 | |
| 152 Parrell Rd at Murphy Rd | 0 152 | 120 | 65 | 25 | 30 | 60 | 45 | 75 | 190 | 25 | 30 | 220 | 60 | |
| 153 US 97 SB Ramps and New Interchange | 0 153 | 0 | 0 | 0 | 0 | 0 | 675 | 0 | 0 | 0 | 390 | 0 | 0 | |
| 154 US 97 NB Ramps and New Interchange | 0 154 | 0 | 360 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 390 | 425 | |
| 155 Murphy at Old Murphy | 0 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | 0 | 0 | 310 | 75 | |

| Intersection | Count Date | Peak Hr Start | Total Vehicle Volumes | | | | | | | | | | | |
|--|------------|---------------|-----------------------|------|------|------------|------|------|-----------|------|------|-----------|------|------|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| Import Counts | | | | | | | | | | | | | | |
| Export | | | | | | | | | | | | | | |
| Powers Murphy | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | 4/13/2017 | 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | 4/13/2017 | 4:35 PM | 0 | 1460 | 0 | 0 | 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | 4/13/2017 | 4:35 PM | 0 | 1460 | 0 | 0 | 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | 4/13/2017 | 4:35 PM | 0 | 1705 | 0 | 0 | 2410 | 0 | 0 | 420 | 0 | 0 | 320 | 0 |
| 53 Brookwood at Powers Rd | 4/13/2017 | 4:30 PM | 5 | 445 | 120 | 430 | 580 | 55 | 55 | 60 | 5 | 180 | 70 | 110 |
| 54 3rd at Powers | 4/13/2017 | 4:35 PM | 65 | 580 | 10 | 15 | 1055 | 295 | 300 | 175 | 170 | 20 | 55 | 75 |
| 55 Parrell Rd at Powers Rd | 4/13/2017 | 4:35 PM | 60 | 310 | 0 | 0 | 355 | 90 | 115 | 0 | 85 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 20 | 35 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | 4/13/2017 | 4:35 PM | 20 | 435 | 35 | 30 | 925 | 90 | 70 | 15 | 15 | 70 | 20 | 30 |
| 58 3rd St at Pinebrook | 4/13/2017 | 4:35 PM | 90 | 465 | 5 | 55 | 905 | 40 | 15 | 0 | 40 | 5 | 5 | 30 |
| 59 Murphy at SE 3rd St | 4/13/2017 | 4:30 PM | 45 | 160 | 155 | 210 | 355 | 255 | 275 | 330 | 240 | 220 | 335 | 160 |
| 60 Parrell Rd at China Hat Rd | 4/13/2017 | 4:35 PM | 50 | 0 | 140 | 0 | 0 | 0 | 0 | 390 | 30 | 275 | 270 | 0 |
| 62 Blakely Rd at Powers Rd | 4/13/2017 | 4:45 PM | 90 | 25 | 70 | 20 | 5 | 45 | 10 | 535 | 65 | 110 | 225 | 80 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 340 | 205 | 165 | 495 | 95 | 140 | 90 | 15 | 310 | 140 | 170 |
| 151 New SB Frontage at Murphy Rd | | | 160 | 0 | 330 | 0 | 0 | 0 | 0 | 440 | 20 | 200 | 460 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 180 | 90 | 45 | 175 | 135 | 105 | 125 | 505 | 135 | 60 | 540 | 135 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 360 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 390 | 425 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 80 | 0 | 50 | 10 | 685 | 0 | 0 | 665 | 160 |
| Seasonal Factor | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |
| 24 US 97 NB Ramps at Powers | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 |
| 25 US 97 at Badger | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 26 US97 at Pinebrook | | | 1.00 | 1.31 | 1.00 | 1.00 | 1.31 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 28 US 97 at Ponderosa-China Hat | | | 1.00 | 1.30 | 1.11 | 1.00 | 1.28 | 1.11 | 1.00 | 1.00 | 1.11 | 1.00 | 1.00 | 1.06 |
| 53 Brookwood at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 54 3rd at Powers | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 55 Parrell Rd at Powers Rd | | | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.00 | 1.00 | 1.00 |
| 56 Blakely at Badger | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.06 | 1.06 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 57 3rd St at Badger Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 58 3rd St at Pinebrook | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.06 |
| 59 Murphy at SE 3rd St | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.06 |
| 60 Parrell Rd at China Hat Rd | | | 1.00 | 1.00 | 1.00 | 1.06 | 1.00 | 1.06 | 1.06 | 1.06 | 1.00 | 1.00 | 1.06 | 1.06 |
| 62 Blakely Rd at Powers Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 104 Brookwood Blvd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 151 New SB Frontage at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 152 Parrell Rd at Murphy Rd | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 153 US 97 SB Ramps and New Interchange | | | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.30 | 1.30 | 1.06 | 1.00 |

| Import Counts | | Export | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|--|------------|---------------|------|------------|------|------|------------|------|------|-----------|------|------|-----------|------|--|
| Intersection | Count Date | Peak Hr Start | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
| 154 US 97 NB Ramps and New Interchange | | | 1.30 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.30 | 1.06 | 1.06 | 1.06 | 1.06 | 1.30 | |
| 155 Murphy at Old Murphy | | | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | |
| Seasonally Factored Volumes | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 25 US 97 at Badger | | | 0 | 1912 | 0 | 0 | 2287 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | | | 0 | 1912 | 0 | 0 | 2287 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2216 | 0 | 0 | 3096 | 0 | 0 | 420 | 0 | 0 | 320 | 0 | |
| 53 Brookwood at Powers Rd | | | 5 | 472 | 127 | 456 | 615 | 58 | 58 | 64 | 5 | 191 | 74 | 117 | |
| 54 3rd at Powers | | | 69 | 615 | 11 | 16 | 1118 | 313 | 318 | 186 | 180 | 21 | 58 | 80 | |
| 55 Parrell Rd at Powers Rd | | | 64 | 329 | 0 | 0 | 376 | 95 | 122 | 0 | 90 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | | | 21 | 461 | 37 | 32 | 981 | 95 | 74 | 16 | 16 | 74 | 21 | 32 | |
| 58 3rd St at Pinebrook | | | 95 | 493 | 5 | 58 | 959 | 42 | 16 | 0 | 42 | 5 | 5 | 32 | |
| 59 Murphy at SE 3rd St | | | 48 | 170 | 164 | 223 | 462 | 270 | 292 | 350 | 312 | 286 | 355 | 170 | |
| 60 Parrell Rd at China Hat Rd | | | 50 | 0 | 140 | 0 | 0 | 0 | 0 | 413 | 30 | 275 | 286 | 0 | |
| 62 Blakely Rd at Powers Rd | | | 95 | 27 | 74 | 21 | 5 | 48 | 11 | 567 | 69 | 117 | 239 | 85 | |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 360 | 217 | 175 | 525 | 101 | 148 | 95 | 16 | 329 | 148 | 180 | |
| 151 New SB Frontage at Murphy Rd | | | 170 | 0 | 350 | 0 | 0 | 0 | 0 | 466 | 21 | 212 | 488 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 191 | 95 | 48 | 186 | 143 | 111 | 133 | 535 | 143 | 64 | 572 | 143 | |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 382 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 | 553 | |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 85 | 0 | 53 | 11 | 726 | 0 | 0 | 705 | 170 | |
| Balance Adjustment | | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 25 US 97 at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 US97 at Pinebrook | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 53 Brookwood at Powers Rd | | | 0 | 0 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 54 3rd at Powers | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 55 Parrell Rd at Powers Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 57 3rd St at Badger Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 58 3rd St at Pinebrook | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 59 Murphy at SE 3rd St | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 60 Parrell Rd at China Hat Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 62 Blakely Rd at Powers Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | |
| 104 Brookwood Blvd at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | |
| 151 New SB Frontage at Murphy Rd | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 152 Parrell Rd at Murphy Rd | | | 9 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 23 | 0 | |

| Intersection | Count Date | Peak Hr Start | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
|---|------------|---------------|------------|------|-----|------------|------|-----|-----------|-----|-----|-----------|-----|-----|
| | | | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 36 | 0 |
| Final 2040 30HV Balanced Volumes | | | | | | | | | | | | | | |
| 22 US97 SB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 US 97 NB Ramps at Powers | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 US 97 at Badger | | | 0 | 1912 | 0 | 0 | 2287 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 US97 at Pinebrook | | | 0 | 1912 | 0 | 0 | 2287 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 US 97 at Ponderosa-China Hat | | | 0 | 2216 | 0 | 0 | 3096 | 0 | 0 | 420 | 0 | 0 | 320 | 0 |
| 53 Brookwood at Powers Rd | | | 5 | 472 | 135 | 470 | 615 | 58 | 58 | 64 | 5 | 191 | 74 | 117 |
| 54 3rd at Powers | | | 70 | 615 | 11 | 16 | 1118 | 313 | 318 | 186 | 180 | 21 | 58 | 80 |
| 55 Parrell Rd at Powers Rd | | | 64 | 329 | 0 | 0 | 376 | 95 | 122 | 0 | 90 | 0 | 0 | 0 |
| 56 Blakely at Badger | | | 0 | 0 | 0 | 0 | 0 | 21 | 37 | 0 | 0 | 0 | 0 | 0 |
| 57 3rd St at Badger Rd | | | 21 | 461 | 37 | 32 | 981 | 95 | 74 | 16 | 16 | 74 | 21 | 32 |
| 58 3rd St at Pinebrook | | | 95 | 493 | 5 | 58 | 959 | 42 | 16 | 0 | 42 | 5 | 5 | 32 |
| 59 Murphy at SE 3rd St | | | 48 | 170 | 164 | 223 | 462 | 270 | 292 | 350 | 312 | 286 | 355 | 170 |
| 60 Parrell Rd at China Hat Rd | | | 50 | 0 | 140 | 0 | 0 | 0 | 0 | 413 | 30 | 275 | 286 | 0 |
| 62 Blakely Rd at Powers Rd | | | 95 | 27 | 74 | 21 | 5 | 48 | 11 | 589 | 69 | 117 | 239 | 85 |
| 104 Brookwood Blvd at Murphy Rd | | | 5 | 360 | 217 | 175 | 525 | 101 | 148 | 95 | 16 | 330 | 148 | 180 |
| 151 New SB Frontage at Murphy Rd | | | 170 | 0 | 350 | 0 | 0 | 0 | 0 | 466 | 21 | 212 | 488 | 0 |
| 152 Parrell Rd at Murphy Rd | | | 200 | 95 | 48 | 186 | 143 | 116 | 133 | 535 | 143 | 64 | 595 | 143 |
| 153 US 97 SB Ramps and New Interchange | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 US 97 NB Ramps and New Interchange | | | 0 | 382 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 | 553 |
| 155 Murphy at Old Murphy | | | 0 | 0 | 0 | 85 | 0 | 70 | 11 | 726 | 0 | 0 | 741 | 170 |