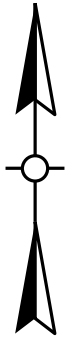


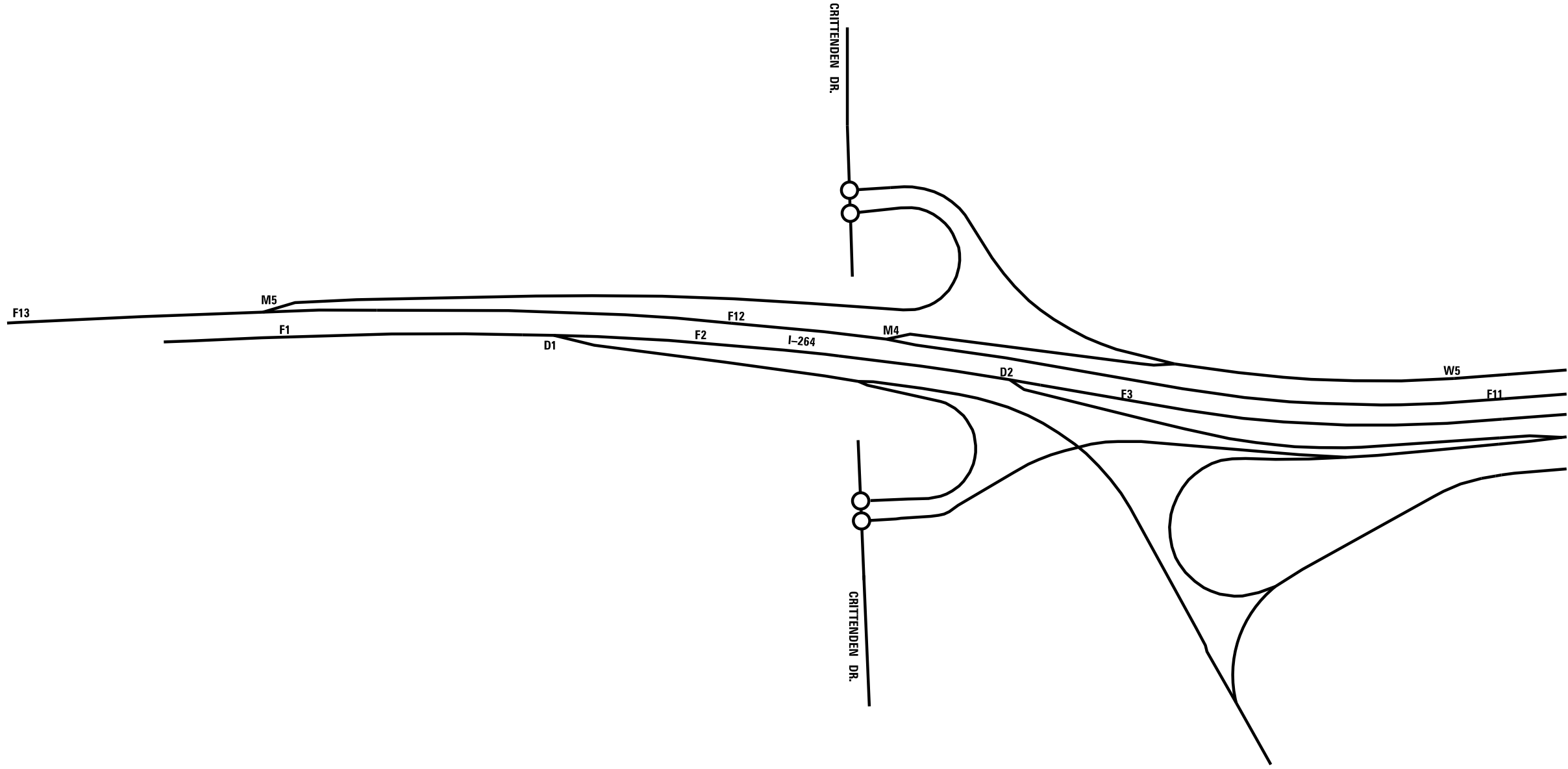
APPENDIX

D HCS ANALYSIS





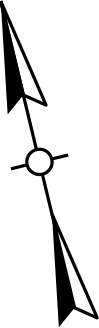
| | | |
|-----------|----------|-----------|
| COUNTY OF | ITEM NO. | SHEET NO. |
| JEFFERSON | N/A | 1 |



| LEGEND | |
|--------|-------------------------------|
| FXX | FREEWAY SEGMENT |
| MXX | MERGE SEGMENT |
| DXX | DIVERGE SEGMENT |
| WXX | WEAVE SEGMENT |
| CDXX | COLLECTOR-DISTRIBUTOR SEGMENT |

SCALE: NTS

I-264 TO CRITTENDEN DR INTERCHANGE
SEGMENT LABELS



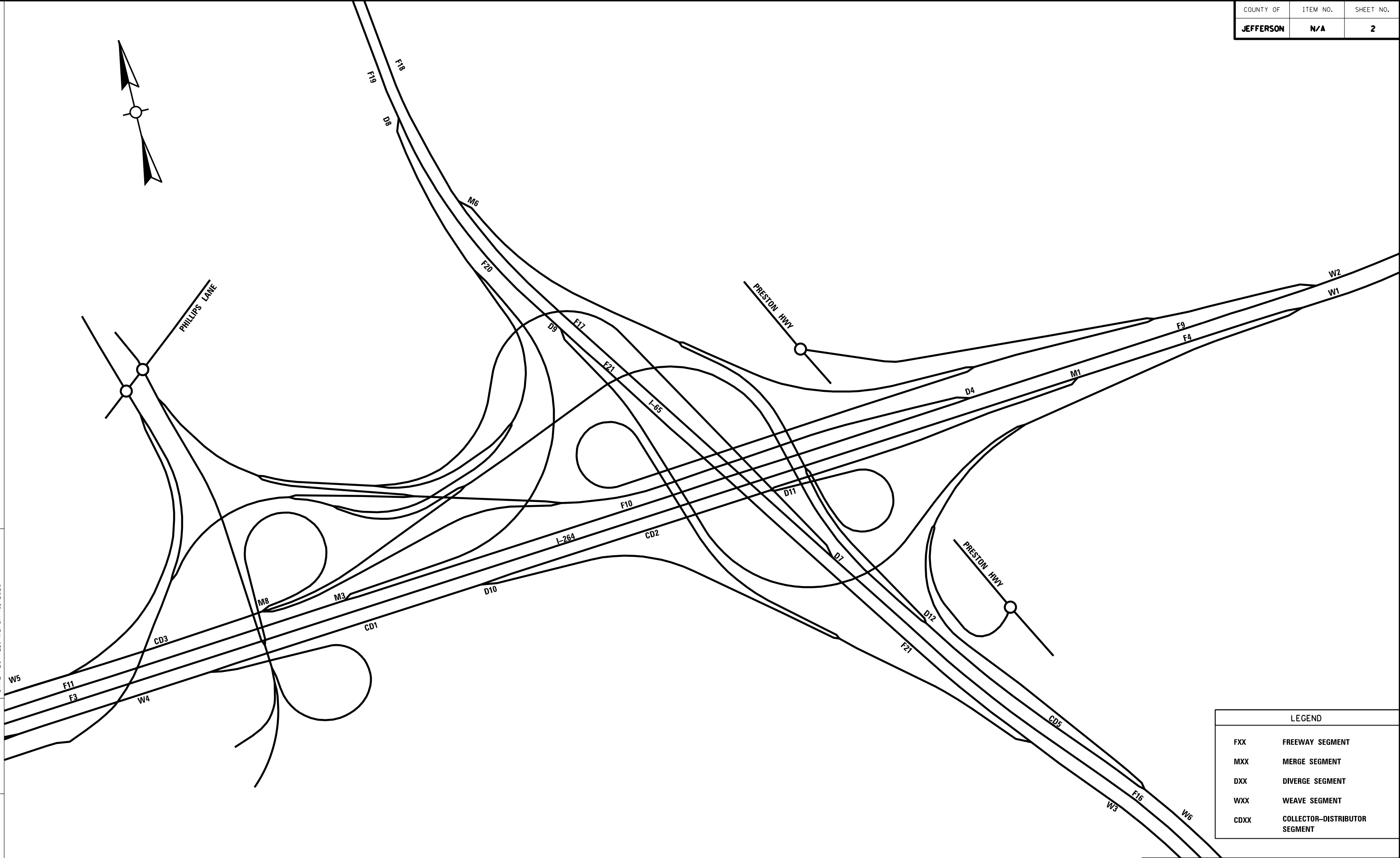
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|-----------|----------|-----------|
| COUNTY OF | ITEM NO. | SHEET NO. |
| JEFFERSON | N/A | 2 |

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USER: mcmlyc
DATE PLOTTED: March 16, 2020

E-SHEET NAME:

MicroStation v8.11.9.714

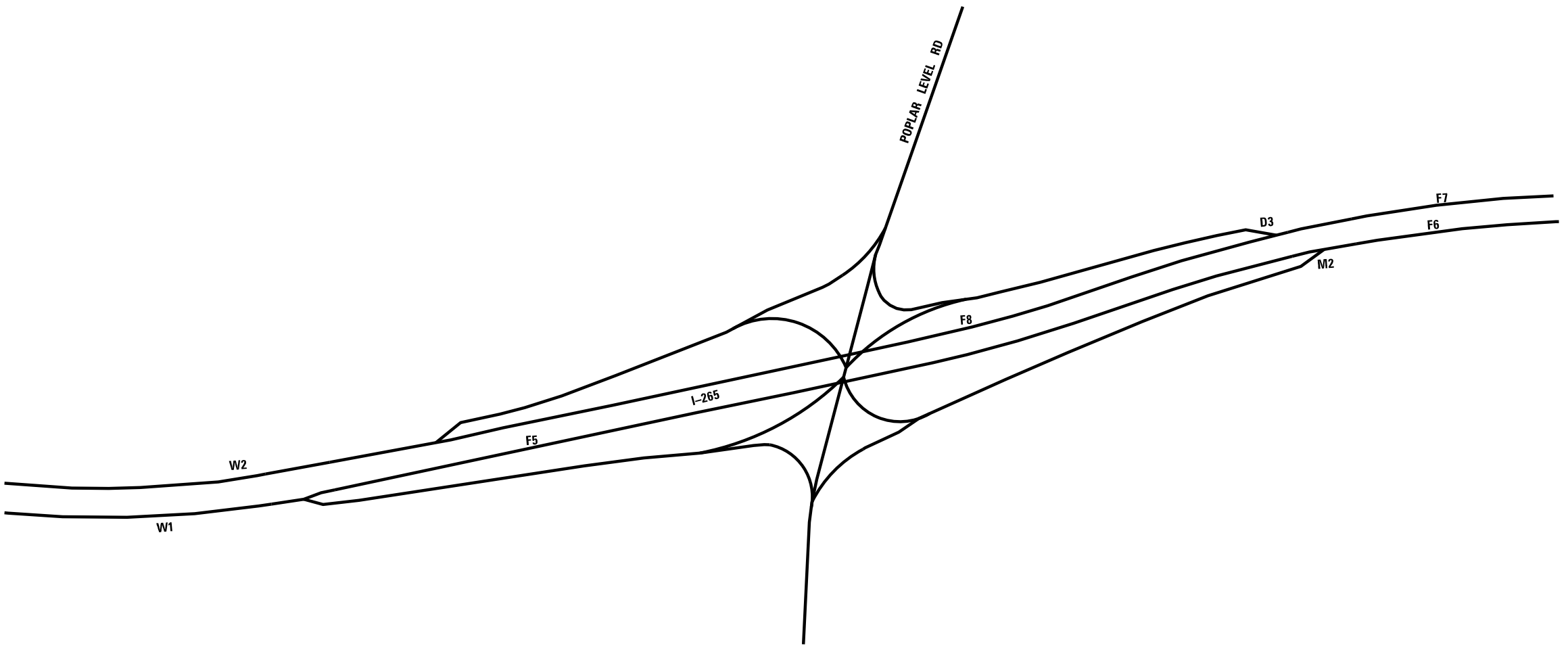
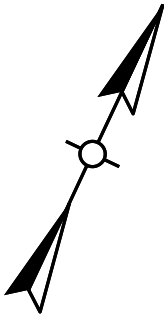


| LEGEND | |
|--------|-------------------------------|
| FXX | FREEWAY SEGMENT |
| MXX | MERGE SEGMENT |
| DXX | DIVERGE SEGMENT |
| WXX | WEAVE SEGMENT |
| CDXX | COLLECTOR-DISTRIBUTOR SEGMENT |

SCALE: NTS

I-264 TO I-655 INTERCHANGE
SEGMENT LABELS

| | | |
|-----------|----------|-----------|
| COUNTY OF | ITEM NO. | SHEET NO. |
| JEFFERSON | N/A | 3 |

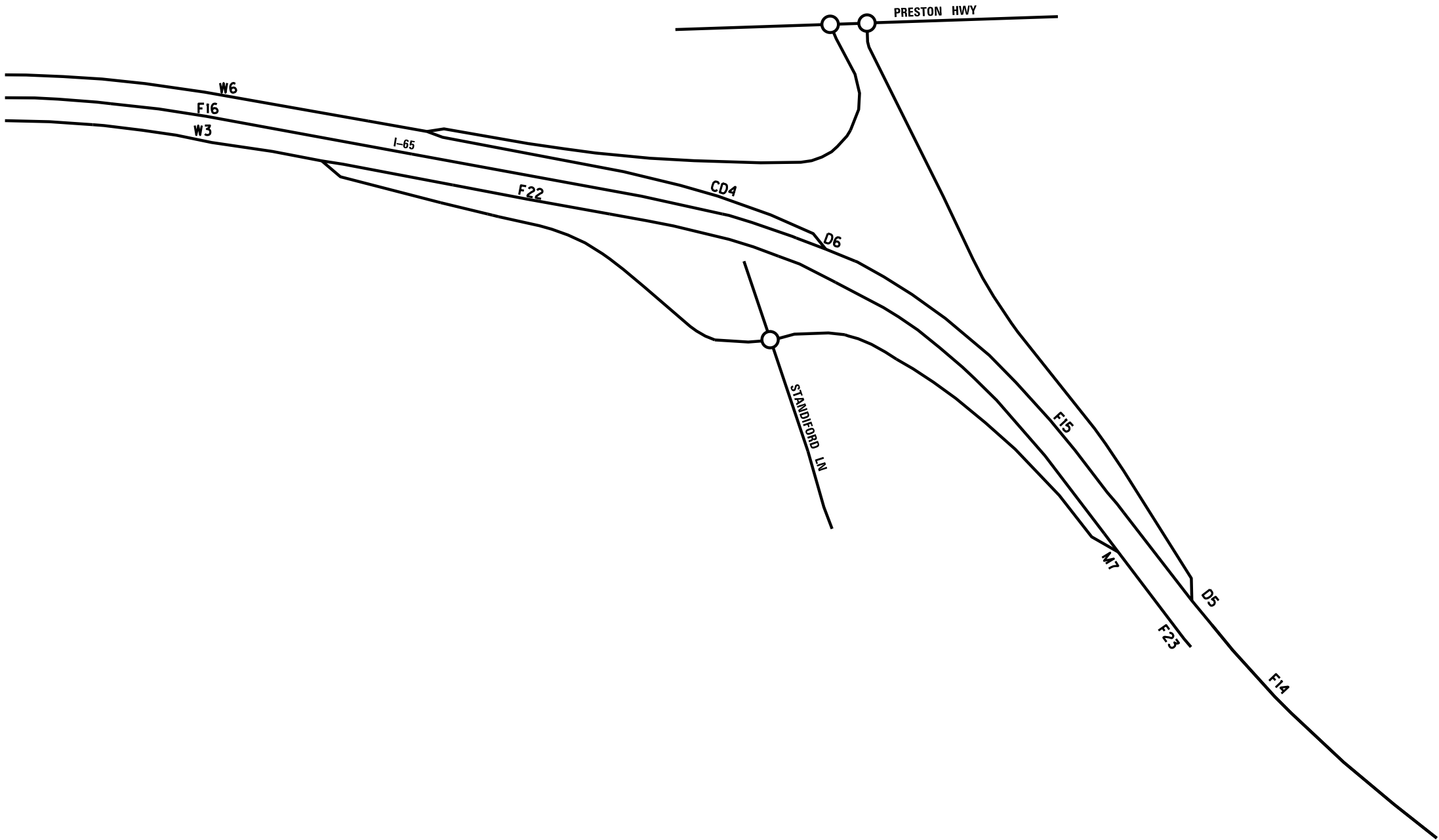
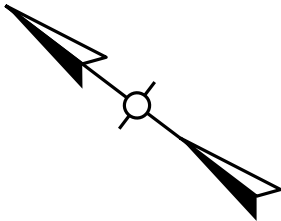


| LEGEND | |
|--------|-------------------------------|
| FXX | FREEWAY SEGMENT |
| MXX | MERGE SEGMENT |
| DXX | DIVERGE SEGMENT |
| WXX | WEAVE SEGMENT |
| CDXX | COLLECTOR-DISTRIBUTOR SEGMENT |

I-264 TO POPLAR LEVEL RD INTERCHANGE
SEGMENT LABELS

SCALE: NTS

| | | |
|-----------|----------|-----------|
| COUNTY OF | ITEM NO. | SHEET NO. |
| JEFFERSON | N/A | 4 |



| LEGEND | |
|--------|-------------------------------|
| FXX | FREEWAY SEGMENT |
| MXX | MERGE SEGMENT |
| DXX | DIVERGE SEGMENT |
| WXX | WEAVE SEGMENT |
| CDXX | COLLECTOR-DISTRIBUTOR SEGMENT |

SCALE: NTS

I-65 TO PRESTON HWY/STANDIFORD LN
SEGMENT LABELS

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 5.40 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 41.7 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5206 | Heavy Vehicle Adjustment Factor (fHV) | 0.953 |
| Peak Hour Factor | 0.97 | Flow Rate (Vp), pc/h/ln | 1408 |
| Total Trucks, % | 4.94 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.68 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 39.6 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 35.6 |
| Total Ramp Density Adjustment | 13.3 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 39.6 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 2 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 630 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5206 | 416 |
| Peak Hour Factor (PHF) | 0.97 | 0.94 |
| Total Trucks, % | 4.94 | 5.53 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.953 | 0.948 |
| Flow Rate (vi),pc/h | 5632 | 467 |
| Capacity (c), pc/h | 8451 | 4132 |
| Volume-to-Capacity Ratio (v/c) | 0.67 | 0.11 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.246 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1690 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.7 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.260 | Outer Lanes Freeway Speed (SO), mi/h | 54.6 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2253 | Ramp Junction Speed (S), mi/h | 52.5 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 26.8 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 18.0 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 4790 | Heavy Vehicle Adjustment Factor (fHV) | 0.953 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1782 |
| Total Trucks, % | 4.89 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.86 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|---|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | - |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | - |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | F |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|---------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1380 | 230 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Freeway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 4790 | 1710 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 4.89 | 8.01 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.953 | 0.926 |
| Flow Rate (vi),pc/h | 5347 | 1965 |
| Capacity (c), pc/h | 6338 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.84 | 0.95 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.381 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | 1569 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 48.3 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.536 | Outer Lanes Freeway Speed (SO), mi/h | 55.0 |
| Flow in Lanes 1 and 2 (v12), pc/h | 3778 | Ramp Junction Speed (S), mi/h | 50.1 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 35.6 |
| Level of Service (LOS) | D | Density in Ramp Influence Area (DR), pc/mi/ln | 34.7 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 1.42 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 50.7 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3080 | Heavy Vehicle Adjustment Factor (fHV) | 0.969 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1127 |
| Total Trucks, % | 3.15 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.55 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 48.1 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 23.4 |
| Total Ramp Density Adjustment | 4.3 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 48.1 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 300 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 3080 | 794 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 3.15 | 3.15 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.969 | 0.969 |
| Flow Rate (vi),pc/h | 3381 | 872 |
| Capacity (c), pc/h | 6338 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.67 | 0.42 |

Speed and Density

| | | | |
|--|--------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | 1371.5 | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 7500 | Speed Index (MS) | 0.357 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1400 |
| Distance to Downstream Ramp (LDOWN), ft | 10000 | On-Ramp Influence Area Speed (SR), mi/h | 48.6 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.586 | Outer Lanes Freeway Speed (SO), mi/h | 49.0 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1981 | Ramp Junction Speed (S), mi/h | 48.7 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 2853 | Average Density (D), pc/mi/ln | 29.1 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 25.5 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3874 | Heavy Vehicle Adjustment Factor (fHV) | 0.969 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1418 |
| Total Trucks, % | 3.15 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.69 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 36.8 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|---------|
| Number of Lanes (N), ln | 5 | Segment Type | Freeway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 0 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 0 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 2758 | 2828 | 361 | 1116 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 2.54 | 7.25 | 7.20 | 4.66 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.975 | 0.932 | 0.933 | 0.955 |
| Flow Rate (vi), pc/h | 3009 | 3228 | 412 | 1243 |
| Weaving Flow Rate (vw), pc/h | 4471 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 3421 | Density-Based Capacity (ciWL), pc/h/ln | | 1563 |
| Total Flow Rate (v), pc/h | 7892 | Demand Flow-Based Capacity (ciW), pc/h | | 4233 |
| Volume Ratio (VR) | 0.567 | Weaving Segment Capacity (cw), veh/h | | 4030 |
| Minimum Lane Change Rate (LCMIN), lc/h | 0 | Adjusted Weaving Area Capacity, pc/h | | 3974 |
| Maximum Weaving Length (LMAX), ft | 8620 | Volume-to-Capacity Ratio (v/c) | | 1.99 |

Speed and Density

| | | | |
|---|---|---------------------------------------|---|
| Non-Weaving Vehicle Index (INW) | - | Average Weaving Speed (SW),mi/h | - |
| Non-Weaving Lane Change Rate (LCNW), lc/h | - | Average Non-Weaving Speed (SNW), mi/h | - |
| Weaving Lane Change Rate (LCW), lc/h | - | Average Speed (S), mi/h | - |
| Weaving Lane Change Rate (LCAII), lc/h | - | Density (D), pc/mi/ln | - |
| Weaving Intensity Factor (W) | - | Level of Service (LOS) | F |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, ln | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 3.40 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 39.4 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 6129 | Heavy Vehicle Adjustment Factor (fhv) | 0.957 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1703 |
| Total Trucks, % | 4.52 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.82 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (flw) | 6.6 | Average Speed (S), mi/h | 45.9 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 45.0 |
| Total Ramp Density Adjustment | 9.0 | Level of Service (LOS) | F |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 37.4 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 440 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 6129 | 1137 |
| Peak Hour Factor (PHF) | 0.98 | 0.82 |
| Total Trucks, % | 4.52 | 0.18 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.957 | 0.998 |
| Flow Rate (vi),pc/h | 6535 | 1389 |
| Capacity (c), pc/h | 8451 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.94 | 0.67 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | 7500 | Speed Index (MS) | 0.489 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1961 |
| Distance to Downstream Ramp (LDOWN), ft | 10000 | On-Ramp Influence Area Speed (SR), mi/h | 47.2 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.044 | Outer Lanes Freeway Speed (SO), mi/h | 46.9 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2614 | Ramp Junction Speed (S), mi/h | 47.1 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 4003 | Average Density (D), pc/mi/ln | 42.1 |
| Level of Service (LOS) | D | Density in Ramp Influence Area (DR), pc/mi/ln | 33.4 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, ln | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 2.99 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 40.3 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 7266 | Heavy Vehicle Adjustment Factor (fhv) | 0.963 |
| Peak Hour Factor | 0.98 | Flow Rate (Vp), pc/h/ln | 1925 |
| Total Trucks, % | 3.84 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.93 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (flw) | 6.6 | Average Speed (S), mi/h | 45.9 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 45.0 |
| Total Ramp Density Adjustment | 8.1 | Level of Service (LOS) | F |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.3 | | |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 3.23 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 39.8 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5391 | Heavy Vehicle Adjustment Factor (fHV) | 0.953 |
| Peak Hour Factor | 0.97 | Flow Rate (Vp), pc/h/ln | 1458 |
| Total Trucks, % | 4.97 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.71 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 6.6 | Average Speed (S), mi/h | 37.8 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 38.6 |
| Total Ramp Density Adjustment | 8.6 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 37.8 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 310 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5391 | 771 |
| Peak Hour Factor (PHF) | 0.97 | 0.84 |
| Total Trucks, % | 4.97 | 0.52 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.953 | 0.995 |
| Flow Rate (vi),pc/h | 5832 | 922 |
| Capacity (c), pc/h | 8451 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.69 | 0.45 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.287 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1385 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.3 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.436 | Outer Lanes Freeway Speed (SO), mi/h | 55.8 |
| Flow in Lanes 1 and 2 (v12), pc/h | 3063 | Ramp Junction Speed (S), mi/h | 52.2 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 27.9 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 27.8 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 4.26 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 37.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 4620 | Heavy Vehicle Adjustment Factor (fHV) | 0.946 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1299 |
| Total Trucks, % | 5.71 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.63 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 6.6 | Average Speed (S), mi/h | 35.6 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 36.5 |
| Total Ramp Density Adjustment | 10.9 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 35.6 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|---------|
| Number of Lanes (N), ln | 5 | Segment Type | Freeway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 0 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 2722 | 464 | 743 | 1898 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 3.93 | 3.02 | 2.42 | 8.27 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.962 | 0.971 | 0.976 | 0.924 |
| Flow Rate (vi), pc/h | 3010 | 508 | 810 | 2185 |
| Weaving Flow Rate (vw), pc/h | 2693 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 3820 | Density-Based Capacity (ciWL), pc/h/ln | | 1700 |
| Total Flow Rate (v), pc/h | 6513 | Demand Flow-Based Capacity (ciW), pc/h | | 5811 |
| Volume Ratio (VR) | 0.413 | Weaving Segment Capacity (cw), veh/h | | 5530 |
| Minimum Lane Change Rate (LCMIN), lc/h | 0 | Adjusted Weaving Area Capacity, pc/h | | 5457 |
| Maximum Weaving Length (LMAX), ft | 6827 | Volume-to-Capacity Ratio (v/c) | | 1.19 |

Speed and Density

| | | | |
|---|---|---------------------------------------|---|
| Non-Weaving Vehicle Index (INW) | - | Average Weaving Speed (SW),mi/h | - |
| Non-Weaving Lane Change Rate (LCNW), lc/h | - | Average Non-Weaving Speed (SNW), mi/h | - |
| Weaving Lane Change Rate (LCW), lc/h | - | Average Speed (S), mi/h | - |
| Weaving Lane Change Rate (LCAII), lc/h | - | Density (D), pc/mi/ln | - |
| Weaving Intensity Factor (W) | - | Level of Service (LOS) | F |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, ln | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 5.71 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 34.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3537 | Heavy Vehicle Adjustment Factor (fhv) | 0.965 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 975 |
| Total Trucks, % | 3.65 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.47 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (flw) | 6.6 | Average Speed (S), mi/h | 32.8 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 29.7 |
| Total Ramp Density Adjustment | 13.9 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 32.8 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 2 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 510 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 3537 | 666 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 3.65 | 5.41 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.965 | 0.949 |
| Flow Rate (vi),pc/h | 3899 | 747 |
| Capacity (c), pc/h | 8451 | 4132 |
| Volume-to-Capacity Ratio (v/c) | 0.46 | 0.18 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.272 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1166 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.4 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.260 | Outer Lanes Freeway Speed (SO), mi/h | 56.6 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1567 | Ramp Junction Speed (S), mi/h | 53.5 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 18.2 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 13.1 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 3.28 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 39.7 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 2871 | Heavy Vehicle Adjustment Factor (fhv) | 0.969 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 788 |
| Total Trucks, % | 3.24 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.38 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (flw) | 6.6 | Average Speed (S), mi/h | 37.7 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 20.9 |
| Total Ramp Density Adjustment | 8.7 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 37.7 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 550 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 3057 | 186 |
| Peak Hour Factor (PHF) | 0.94 | 0.87 |
| Total Trucks, % | 3.30 | 4.30 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.968 | 0.959 |
| Flow Rate (vi),pc/h | 3360 | 223 |
| Capacity (c), pc/h | 6338 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.57 | 0.11 |

Speed and Density

| | | | |
|--|--------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | 1339.1 | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 3260 | Speed Index (MS) | 0.299 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1368 |
| Distance to Downstream Ramp (LDOWN), ft | 4000 | On-Ramp Influence Area Speed (SR), mi/h | 49.2 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.593 | Outer Lanes Freeway Speed (SO), mi/h | 49.1 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1992 | Ramp Junction Speed (S), mi/h | 49.2 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 2215 | Average Density (D), pc/mi/ln | 24.3 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 19.3 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 2.67 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 41.1 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3057 | Heavy Vehicle Adjustment Factor (fHV) | 0.968 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1120 |
| Total Trucks, % | 3.30 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.54 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 6.6 | Average Speed (S), mi/h | 39.0 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 28.7 |
| Total Ramp Density Adjustment | 7.3 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 39.0 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 2 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 1000 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 3057 | 1546 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 3.30 | 4.98 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.968 | 0.953 |
| Flow Rate (vi),pc/h | 3360 | 1726 |
| Capacity (c), pc/h | 6338 | 4132 |
| Volume-to-Capacity Ratio (v/c) | 0.80 | 0.42 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 4000 | Speed Index (MS) | 0.366 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1440 |
| Distance to Downstream Ramp (LDOWN), ft | 1960 | On-Ramp Influence Area Speed (SR), mi/h | 48.5 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.555 | Outer Lanes Freeway Speed (SO), mi/h | 48.8 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1920 | Ramp Junction Speed (S), mi/h | 48.6 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 3646 | Average Density (D), pc/mi/ln | 34.9 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 26.9 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 5.41 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 35.1 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 4603 | Heavy Vehicle Adjustment Factor (fHV) | 0.963 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1271 |
| Total Trucks, % | 3.87 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.62 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 6.6 | Average Speed (S), mi/h | 33.3 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 38.2 |
| Total Ramp Density Adjustment | 13.3 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 33.3 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 500 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 4603 | 212 |
| Peak Hour Factor (PHF) | 0.96 | 0.65 |
| Total Trucks, % | 3.87 | 5.66 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.963 | 0.946 |
| Flow Rate (vi),pc/h | 4979 | 345 |
| Capacity (c), pc/h | 8451 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.63 | 0.17 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | 4000 | Speed Index (MS) | 0.309 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1494 |
| Distance to Downstream Ramp (LDOWN), ft | 1960 | On-Ramp Influence Area Speed (SR), mi/h | 49.0 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.175 | Outer Lanes Freeway Speed (SO), mi/h | 48.6 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1992 | Ramp Junction Speed (S), mi/h | 48.8 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 2337 | Average Density (D), pc/mi/ln | 27.3 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 20.5 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 10 | Free-Flow Speed (FFS), mi/h | 33.9 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 4815 | Heavy Vehicle Adjustment Factor (fHV) | 0.962 |
| Peak Hour Factor | 0.96 | Flow Rate (Vp), pc/h/ln | 1304 |
| Total Trucks, % | 3.95 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.63 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 6.6 | Average Speed (S), mi/h | 32.2 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 40.5 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 32.2 | | |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 5 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 2.33 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 48.4 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5683 | Heavy Vehicle Adjustment Factor (fHV) | 0.925 |
| Peak Hour Factor | 0.95 | Flow Rate (Vp), pc/h/ln | 1293 |
| Total Trucks, % | 8.09 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.63 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 46.0 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 28.1 |
| Total Ramp Density Adjustment | 6.6 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 46.0 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 5 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 310 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5683 | 358 |
| Peak Hour Factor (PHF) | 0.95 | 0.84 |
| Total Trucks, % | 8.09 | 8.66 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.925 | 0.920 |
| Flow Rate (vi),pc/h | 6467 | 463 |
| Capacity (c), pc/h | 10564 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.61 | 0.22 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.246 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1419 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.7 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.436 | Outer Lanes Freeway Speed (SO), mi/h | 55.6 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2658 | Ramp Junction Speed (S), mi/h | 52.6 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 24.6 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 24.3 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 5 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5325 | Heavy Vehicle Adjustment Factor (fHV) | 0.925 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1225 |
| Total Trucks, % | 8.06 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.59 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 31.8 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 5 | 2 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 1500 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5325 | 2592 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 8.06 | 7.52 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.925 | 0.930 |
| Flow Rate (vi),pc/h | 6124 | 2965 |
| Capacity (c), pc/h | 10564 | 4132 |
| Volume-to-Capacity Ratio (v/c) | 0.58 | 0.72 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.471 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 829 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 47.4 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.260 | Outer Lanes Freeway Speed (SO), mi/h | 57.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 3548 | Ramp Junction Speed (S), mi/h | 50.2 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 24.4 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 21.3 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 2.22 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 48.7 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 2733 | Heavy Vehicle Adjustment Factor (fHV) | 0.921 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1052 |
| Total Trucks, % | 8.56 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.51 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 46.3 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 22.7 |
| Total Ramp Density Adjustment | 6.3 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 46.3 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|---------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 210 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Freeway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 2733 | 69 |
| Peak Hour Factor (PHF) | 0.94 | 0.91 |
| Total Trucks, % | 8.56 | 4.35 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fhv) | 0.921 | 0.958 |
| Flow Rate (vi),pc/h | 3157 | 79 |
| Capacity (c), pc/h | 6338 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.50 | 0.04 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.212 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | 994 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 50.0 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.677 | Outer Lanes Freeway Speed (So), mi/h | 57.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2163 | Ramp Junction Speed (S), mi/h | 52.1 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 20.2 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 21.0 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 4.17 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 44.3 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 2664 | Heavy Vehicle Adjustment Factor (fHV) | 0.920 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1027 |
| Total Trucks, % | 8.67 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.50 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 42.1 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 24.4 |
| Total Ramp Density Adjustment | 10.7 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 42.1 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|---------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 2 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 1260 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Freeway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 2664 | 1163 |
| Peak Hour Factor (PHF) | 0.98 | 0.94 |
| Total Trucks, % | 8.67 | 3.44 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.920 | 0.967 |
| Flow Rate (vi),pc/h | 2955 | 1279 |
| Capacity (c), pc/h | 6338 | 4132 |
| Volume-to-Capacity Ratio (v/c) | 0.67 | 0.31 |

Speed and Density

| | | | |
|--|--------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | 1793.6 | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 2550 | Speed Index (MS) | 0.265 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 1266 |
| Distance to Downstream Ramp (LDOWN), ft | - | On-Ramp Influence Area Speed (SR), mi/h | 49.5 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.555 | Outer Lanes Freeway Speed (SO), mi/h | 49.4 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1689 | Ramp Junction Speed (S), mi/h | 49.5 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 2968 | Average Density (D), pc/mi/ln | 28.5 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 20.2 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 1.50 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 50.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3827 | Heavy Vehicle Adjustment Factor (fHV) | 0.934 |
| Peak Hour Factor | 0.98 | Flow Rate (Vp), pc/h/ln | 1045 |
| Total Trucks, % | 7.08 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.51 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 47.9 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 21.8 |
| Total Ramp Density Adjustment | 4.5 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 47.9 | | |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 1.77 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 49.8 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5384 | Heavy Vehicle Adjustment Factor (fHV) | 0.947 |
| Peak Hour Factor | 0.99 | Flow Rate (Vp), pc/h/ln | 1436 |
| Total Trucks, % | 5.55 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.70 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 47.3 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 30.4 |
| Total Ramp Density Adjustment | 5.2 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 47.3 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|--------------------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1500 | 170 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Highway/CD Roadway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5384 | 374 |
| Peak Hour Factor (PHF) | 0.99 | 0.94 |
| Total Trucks, % | 5.55 | 2.67 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.947 | 0.974 |
| Flow Rate (vi),pc/h | 5743 | 408 |
| Capacity (c), pc/h | 7512 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.76 | 0.20 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.241 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | 1505 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.7 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.436 | Outer Lanes Freeway Speed (So), mi/h | 55.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2734 | Ramp Junction Speed (S), mi/h | 52.5 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 27.3 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 26.2 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, ln | 4 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 5010 | Heavy Vehicle Adjustment Factor (fhv) | 0.945 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1410 |
| Total Trucks, % | 5.77 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.68 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (flw) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 36.6 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|---------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 4 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1380 | 1380 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Freeway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 5010 | 1099 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 |
| Total Trucks, % | 5.77 | 8.55 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.945 | 0.921 |
| Flow Rate (vi),pc/h | 5640 | 1269 |
| Capacity (c), pc/h | 8451 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.67 | 0.61 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.319 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | 1233 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 48.9 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.436 | Outer Lanes Freeway Speed (SO), mi/h | 56.4 |
| Flow in Lanes 1 and 2 (v12), pc/h | 3175 | Ramp Junction Speed (S), mi/h | 51.9 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 27.2 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 19.1 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 3.45 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 45.9 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 3911 | Heavy Vehicle Adjustment Factor (fHV) | 0.952 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1457 |
| Total Trucks, % | 4.99 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.71 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 43.6 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 33.4 |
| Total Ramp Density Adjustment | 9.1 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 43.6 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|---------|
| Number of Lanes (N), ln | 5 | Segment Type | Freeway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 0 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 3741 | 2957 | 390 | 170 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 4.88 | 8.00 | 0.24 | 0.10 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.953 | 0.926 | 0.998 | 0.999 |
| Flow Rate (vi), pc/h | 4176 | 3397 | 416 | 181 |
| Weaving Flow Rate (vw), pc/h | 3578 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 4592 | Density-Based Capacity (ciWL), pc/h/ln | | 1678 |
| Total Flow Rate (v), pc/h | 8170 | Demand Flow-Based Capacity (ciW), pc/h | | 5479 |
| Volume Ratio (VR) | 0.438 | Weaving Segment Capacity (cw), veh/h | | 5179 |
| Minimum Lane Change Rate (LCMIN), lc/h | 0 | Adjusted Weaving Area Capacity, pc/h | | 5146 |
| Maximum Weaving Length (LMAX), ft | 7111 | Volume-to-Capacity Ratio (v/c) | | 1.59 |

Speed and Density

| | | | |
|---|---|---------------------------------------|---|
| Non-Weaving Vehicle Index (INW) | - | Average Weaving Speed (SW),mi/h | - |
| Non-Weaving Lane Change Rate (LCNW), lc/h | - | Average Non-Weaving Speed (SNW), mi/h | - |
| Weaving Lane Change Rate (LCW), lc/h | - | Average Speed (S), mi/h | - |
| Weaving Lane Change Rate (LCAII), lc/h | - | Density (D), pc/mi/ln | - |
| Weaving Intensity Factor (W) | - | Level of Service (LOS) | F |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 5 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 3.77 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 45.2 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 6820 | Heavy Vehicle Adjustment Factor (fHV) | 0.937 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1549 |
| Total Trucks, % | 6.67 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.75 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 42.9 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 36.1 |
| Total Ramp Density Adjustment | 9.8 | Level of Service (LOS) | E |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 42.9 | | |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|---------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 6 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 1500 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Freeway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 6820 | 595 |
| Peak Hour Factor (PHF) | 0.98 | 0.91 |
| Total Trucks, % | 6.67 | 5.04 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.937 | 0.952 |
| Flow Rate (vi),pc/h | 7427 | 687 |
| Capacity (c), pc/h | 12677 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.64 | 0.33 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 2 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (MS) | 0.236 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/h/ln | 1671 |
| Distance to Downstream Ramp (LDOWN), ft | - | On-Ramp Influence Area Speed (SR), mi/h | 49.8 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.132 | Outer Lanes Freeway Speed (SO), mi/h | 48.0 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2228 | Ramp Junction Speed (S), mi/h | 48.8 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 2915 | Average Density (D), pc/mi/ln | 27.7 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 18.6 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/9/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 6 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 2.82 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 47.3 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 7415 | Heavy Vehicle Adjustment Factor (fHV) | 0.939 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1400 |
| Total Trucks, % | 6.54 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.68 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 44.9 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 31.2 |
| Total Ramp Density Adjustment | 7.7 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 44.9 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|--------------------|
| Number of Lanes (N), ln | 3 | Segment Type | Highway/CD Roadway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 0 |
| Weaving Configuration | Two-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 2 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 1066 | 1262 | 90 | 644 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 5.20 | 2.59 | 0.22 | 2.81 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.951 | 0.975 | 0.998 | 0.973 |
| Flow Rate (vi), pc/h | 1192 | 1377 | 96 | 704 |
| Weaving Flow Rate (vw), pc/h | 96 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 3273 | Density-Based Capacity (ciWL), pc/h/ln | | 1764 |
| Total Flow Rate (v), pc/h | 3369 | Demand Flow-Based Capacity (ciW), pc/h | | - |
| Volume Ratio (VR) | 0.028 | Weaving Segment Capacity (cw), veh/h | | 5116 |
| Minimum Lane Change Rate (LCMIN), lc/h | 192 | Adjusted Weaving Area Capacity, pc/h | | 4969 |
| Maximum Weaving Length (LMAX), ft | 5987 | Volume-to-Capacity Ratio (v/c) | | 0.68 |

Speed and Density

| | | | |
|---|-------|---------------------------------------|------|
| Non-Weaving Vehicle Index (INW) | 0 | Average Weaving Speed (SW),mi/h | 52.2 |
| Non-Weaving Lane Change Rate (LCNW), lc/h | 96 | Average Non-Weaving Speed (SNW), mi/h | 45.4 |
| Weaving Lane Change Rate (LCW), lc/h | 192 | Average Speed (S), mi/h | 45.6 |
| Weaving Lane Change Rate (LCAII), lc/h | 288 | Density (D), pc/mi/ln | 24.6 |
| Weaving Intensity Factor (W) | 0.000 | Level of Service (LOS) | C |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 2988 | Heavy Vehicle Adjustment Factor (fHV) | 0.976 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 1086 |
| Total Trucks, % | 2.41 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.53 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 28.2 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | D |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|--------------------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1370 | 340 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Highway/CD Roadway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 2988 | 1860 |
| Peak Hour Factor (PHF) | 0.97 | 0.97 |
| Total Trucks, % | 5.76 | 7.58 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fhv) | 0.946 | 0.930 |
| Flow Rate (vi),pc/h | 3256 | 2062 |
| Capacity (c), pc/h | 5634 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.58 | 1.00 |

Speed and Density

| | | | |
|--|--------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 1370 | Speed Index (Ds) | 0.390 |
| Downstream Equilibrium Distance (LEQ), ft | 1549.8 | Flow Outer Lanes (vOA), pc/h/ln | 493 |
| Distance to Downstream Ramp (LDOWN), ft | 1400 | Off-Ramp Influence Area Speed (SR), mi/h | 48.2 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.587 | Outer Lanes Freeway Speed (SO), mi/h | 57.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 2763 | Ramp Junction Speed (S), mi/h | 49.4 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 22.0 |
| Level of Service (LOS) | C | Density in Ramp Influence Area (DR), pc/mi/ln | 25.0 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 2 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 1128 | Heavy Vehicle Adjustment Factor (fHV) | 0.973 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 616 |
| Total Trucks, % | 2.75 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.30 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 16.0 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | B |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|---------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 2 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 20.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1400 | 320 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Freeway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 1128 | 334 |
| Peak Hour Factor (PHF) | 0.94 | 0.77 |
| Total Trucks, % | 2.75 | 1.80 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fhv) | 0.973 | 0.982 |
| Flow Rate (vi),pc/h | 1233 | 442 |
| Capacity (c), pc/h | 4226 | 1690 |
| Volume-to-Capacity Ratio (v/c) | 0.29 | 0.26 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 0 |
| Distance to Upstream Ramp (LUP), ft | - | Speed Index (Ds) | 0.676 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | - |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 45.3 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 1.000 | Outer Lanes Freeway Speed (So), mi/h | 57.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1233 | Ramp Junction Speed (S), mi/h | 45.3 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 13.6 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 12.0 |

HCS7 Freeway Merge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | |
|--|--------------------|-------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 25.0 |
| Segment Length (L) / Acceleration Length (LA),ft | 1500 | 530 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Side | Highway/CD Roadway | Right |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 1561 | 133 |
| Peak Hour Factor (PHF) | 0.94 | 0.81 |
| Total Trucks, % | 5.64 | 0.75 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.947 | 0.993 |
| Flow Rate (vi),pc/h | 1754 | 165 |
| Capacity (c), pc/h | 5634 | 1784 |
| Volume-to-Capacity Ratio (v/c) | 0.34 | 0.09 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 220 | Speed Index (MS) | 0.309 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (VOA), pc/mi/ln | 716 |
| Distance to Downstream Ramp (LDOWN), ft | 1250 | On-Ramp Influence Area Speed (SR), mi/h | 49.0 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFM) | 0.592 | Outer Lanes Freeway Speed (SO), mi/h | 51.4 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1038 | Ramp Junction Speed (S), mi/h | 49.9 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | 1203 | Average Density (D), pc/mi/ln | 12.8 |
| Level of Service (LOS) | B | Density in Ramp Influence Area (DR), pc/mi/ln | 11.5 |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 1694 | Heavy Vehicle Adjustment Factor (fHV) | 0.950 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 632 |
| Total Trucks, % | 5.25 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.31 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 16.4 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | B |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|--------------------|
| Number of Lanes (N), ln | 4 | Segment Type | Highway/CD Roadway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 0 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 1601 | 208 | 48 | 93 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 4.72 | 2.73 | 2.73 | 0.53 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.955 | 0.973 | 0.973 | 0.995 |
| Flow Rate (vi), pc/h | 1783 | 227 | 52 | 99 |
| Weaving Flow Rate (vw), pc/h | 326 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 1835 | Density-Based Capacity (ciWL), pc/h/ln | | 1913 |
| Total Flow Rate (v), pc/h | 2161 | Demand Flow-Based Capacity (ciW), pc/h | | 15894 |
| Volume Ratio (VR) | 0.151 | Weaving Segment Capacity (cw), veh/h | | 7340 |
| Minimum Lane Change Rate (LCMIN), lc/h | 227 | Adjusted Weaving Area Capacity, pc/h | | 7185 |
| Maximum Weaving Length (LMAX), ft | 4041 | Volume-to-Capacity Ratio (v/c) | | 0.30 |

Speed and Density

| | | | |
|---|-------|---------------------------------------|------|
| Non-Weaving Vehicle Index (INW) | 0 | Average Weaving Speed (SW),mi/h | 52.2 |
| Non-Weaving Lane Change Rate (LCNW), lc/h | 0 | Average Non-Weaving Speed (SNW), mi/h | 48.0 |
| Weaving Lane Change Rate (LCW), lc/h | 227 | Average Speed (S), mi/h | 48.6 |
| Weaving Lane Change Rate (LCAII), lc/h | 227 | Density (D), pc/mi/ln | 11.1 |
| Weaving Intensity Factor (W) | 0.000 | Level of Service (LOS) | A |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 2592 | Heavy Vehicle Adjustment Factor (fHV) | 0.930 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 988 |
| Total Trucks, % | 7.52 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.48 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 25.7 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | C |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Weaving Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|----------------------------------|-----------|---|--------------------|
| Number of Lanes (N), ln | 4 | Segment Type | Highway/CD Roadway |
| Segment Length (Ls), ft | 0 | Number of Maneuver Lanes (NWL), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes (LCRF), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes (LCFR), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes (LCRR), lc | 0 |
| Interchange Density (ID), int/mi | 4.00 | Cross Weaving Managed Lane | No |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | FF | RF | RR | FR |
|--|-------|--|-------|-------|
| Demand Volume (Vi), veh/h | 2283 | 433 | 196 | 309 |
| Peak Hour Factor (PHF) | 0.94 | 0.94 | 0.94 | 0.94 |
| Total Trucks, % | 7.06 | 3.02 | 0.16 | 0.46 |
| Heavy Vehicle Adjustment Factor (fHV) | 0.934 | 0.971 | 0.998 | 0.995 |
| Flow Rate (vi), pc/h | 2600 | 474 | 209 | 330 |
| Weaving Flow Rate (vw), pc/h | 804 | Freeway Max Capacity (ciFL), pc/h/ln | | 2222 |
| Non-Weaving Flow Rate (vNW), pc/h | 2809 | Density-Based Capacity (ciWL), pc/h/ln | | 1857 |
| Total Flow Rate (v), pc/h | 3613 | Demand Flow-Based Capacity (ciW), pc/h | | 10762 |
| Volume Ratio (VR) | 0.223 | Weaving Segment Capacity (cw), veh/h | | 7043 |
| Minimum Lane Change Rate (LCMIN), lc/h | 804 | Adjusted Weaving Area Capacity, pc/h | | 6975 |
| Maximum Weaving Length (LMAX), ft | 4773 | Volume-to-Capacity Ratio (v/c) | | 0.52 |

Speed and Density

| | | | |
|---|-------|---------------------------------------|------|
| Non-Weaving Vehicle Index (INW) | 0 | Average Weaving Speed (SW),mi/h | 52.2 |
| Non-Weaving Lane Change Rate (LCNW), lc/h | 0 | Average Non-Weaving Speed (SNW), mi/h | 42.1 |
| Weaving Lane Change Rate (LCW), lc/h | 804 | Average Speed (S), mi/h | 44.0 |
| Weaving Lane Change Rate (LCAII), lc/h | 804 | Density (D), pc/mi/ln | 20.5 |
| Weaving Intensity Factor (W) | 0.000 | Level of Service (LOS) | B |

HCS7 Basic Freeway Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|--------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | | |

Geometric Data

| | | | |
|-----------------------------------|------|------------------------------------|-------|
| Number of Lanes, In | 3 | Terrain Type | Level |
| Segment Length (L), ft | - | Percent Grade, % | - |
| Measured or Base Free-Flow Speed | Base | Grade Length, mi | - |
| Base Free-Flow Speed (BFFS), mi/h | 55.0 | Total Ramp Density (TRD), ramps/mi | 6.00 |
| Lane Width, ft | 12 | Free-Flow Speed (FFS), mi/h | 40.5 |
| Right-Side Lateral Clearance, ft | 10 | | |

Adjustment Factors

| | | | |
|-------------------|--------------------|--|-------|
| Driver Population | Balanced Mix | Final Speed Adjustment Factor (SAF) | 0.950 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 0.939 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

Demand and Capacity

| | | | |
|-------------------------------|-------|---------------------------------------|-------|
| Demand Volume veh/h | 1652 | Heavy Vehicle Adjustment Factor (fHV) | 0.951 |
| Peak Hour Factor | 0.94 | Flow Rate (Vp), pc/h/ln | 616 |
| Total Trucks, % | 5.15 | Capacity (c), pc/h/ln | 2200 |
| Single-Unit Trucks (SUT), % | - | Adjusted Capacity (cadj), pc/h/ln | 2066 |
| Tractor-Trailers (TT), % | - | Volume-to-Capacity Ratio (v/c) | 0.30 |
| Passenger Car Equivalent (Et) | 2.000 | | |

Speed and Density

| | | | |
|--|------|-------------------------|------|
| Lane Width Adjustment (fLW) | 0.0 | Average Speed (S), mi/h | 38.5 |
| Right-Side Lateral Clearance Adj. (fRLC) | 0.0 | Density (D), pc/mi/ln | 16.0 |
| Total Ramp Density Adjustment | 14.5 | Level of Service (LOS) | B |
| Adjusted Free-Flow Speed (FFSadj), mi/h | 38.5 | | |

HCS7 Freeway Diverge Report

Project Information

| | | | |
|---------------------|----------------------------|----------------------|-------------------------|
| Analyst | Cameron Manley | Date | 3/10/2020 |
| Agency | WSP | Analysis Year | 2020 |
| Jurisdiction | D05 | Time Period Analyzed | PM Peak Hour |
| Project Description | I-65/264 Interchange Study | Unit | United States Customary |

Geometric Data

| | | |
|--|--------------------|----------------------|
| | Freeway | Ramp |
| Number of Lanes (N), ln | 3 | 1 |
| Free-Flow Speed (FFS), mi/h | 55.0 | 55.0 |
| Segment Length (L) / Deceleration Length (LA),ft | 1400 | 1400 |
| Terrain Type | Level | Level |
| Percent Grade, % | - | - |
| Segment Type / Ramp Type | Highway/CD Roadway | Right-Sided One-Lane |

Adjustment Factors

| | | |
|--|--------------------|--------------------|
| Driver Population | Balanced Mix | Balanced Mix |
| Weather Type | Non-Severe Weather | Non-Severe Weather |
| Incident Type | No Incident | - |
| Final Speed Adjustment Factor (SAF) | 0.950 | 0.950 |
| Final Capacity Adjustment Factor (CAF) | 0.939 | 0.939 |
| Demand Adjustment Factor (DAF) | 1.000 | 1.000 |

Demand and Capacity

| | | |
|---------------------------------------|-------|-------|
| Demand Volume (Vi) | 1652 | 238 |
| Peak Hour Factor (PHF) | 0.94 | 0.92 |
| Total Trucks, % | 5.15 | 3.78 |
| Single-Unit Trucks (SUT), % | - | - |
| Tractor-Trailers (TT), % | - | - |
| Heavy Vehicle Adjustment Factor (fHV) | 0.951 | 0.964 |
| Flow Rate (vi),pc/h | 1848 | 268 |
| Capacity (c), pc/h | 5634 | 2066 |
| Volume-to-Capacity Ratio (v/c) | 0.33 | 0.13 |

Speed and Density

| | | | |
|--|-------|---|-------|
| Upstream Equilibrium Distance (LEQ), ft | - | Number of Outer Lanes on Freeway (NO) | 1 |
| Distance to Upstream Ramp (LUP), ft | 1400 | Speed Index (Ds) | 0.229 |
| Downstream Equilibrium Distance (LEQ), ft | - | Flow Outer Lanes (vOA), pc/h/ln | 472 |
| Distance to Downstream Ramp (LDOWN), ft | - | Off-Ramp Influence Area Speed (SR), mi/h | 49.9 |
| Prop. Freeway Vehicles in Lane 1 and 2 (PFD) | 0.701 | Outer Lanes Freeway Speed (SO), mi/h | 57.3 |
| Flow in Lanes 1 and 2 (v12), pc/h | 1376 | Ramp Junction Speed (S), mi/h | 51.6 |
| Flow Entering Ramp-Infl. Area (vR12), pc/h | - | Average Density (D), pc/mi/ln | 11.9 |
| Level of Service (LOS) | A | Density in Ramp Influence Area (DR), pc/mi/ln | 3.5 |