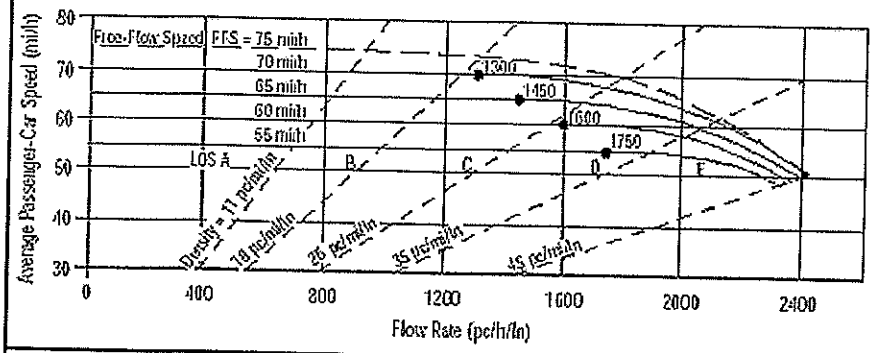
# 2022 No Build

# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

## General Information

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Company | *HNTB* |
| Date Performed | *3/25/2008* |
| Analysis Time Period | *Peak* |

## Site Information

| | |
|---|---|
| Highway/Direction of Travel | *I-4/Eastbound* |
| From/To | *Lake Mary Blvd /CR 46A/SR417* |
| Jurisdiction | |
| Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☒ Oper.(LOS) ☒ Des.(N) ☒ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *6160* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *9* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.957* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *0.45* | I/mi |
| Number of Lanes, N | *3* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *0.0* | mi/h |
| $f_N$ | *3.0* | mi/h |
| FFS | *67.0* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | *2259* | pc/h/ln |
| S | *56.5* | mi/h |
| D = $v_p$ / S | *40.0* | pc/mi/ln |
| LOS | *E* | |

## Design (N)

Design (N)

| | |
|---|---|
| Design LOS | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | pc/h |
| S | mi/h |
| D = $v_p$ / S | pc/mi/ln |
| Required Number of Lanes, N | |

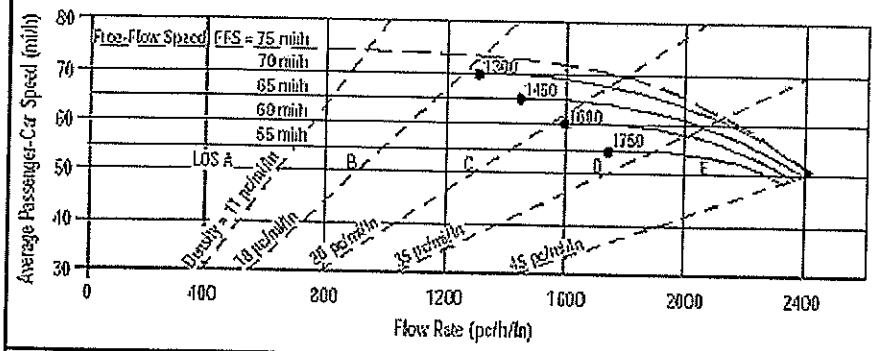
## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |

# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

## General Information

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Company | *HNTB* |
| Date Performed | *3/25/2008* |
| Analysis Time Period | *Peak* |

## Site Information

| | |
|---|---|
| Highway/Direction of Travel | *I-4/Eastbound* |
| From/To | *CR 46A/SR 417/SR 46* |
| Jurisdiction | |
| Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☑ Oper.(LOS) ☑ Des.(N) ☑ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *4870* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *9* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.957* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *0.54* | I/mi |
| Number of Lanes, N | *3* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *0.2* | mi/h |
| $f_N$ | *3.0* | mi/h |
| FFS | *66.8* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | *1786* | pc/h/ln |
| S | *65.5* | mi/h |
| D = $v_p$ / S | *27.3* | pc/mi/ln |
| LOS | *D* | |

## Design (N)

Design (N)

| | | |
|---|---|---|
| Design LOS | | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | | pc/h |
| S | | mi/h |
| D = $v_p$ / S | | pc/mi/ln |
| Required Number of Lanes, N | | |

## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |



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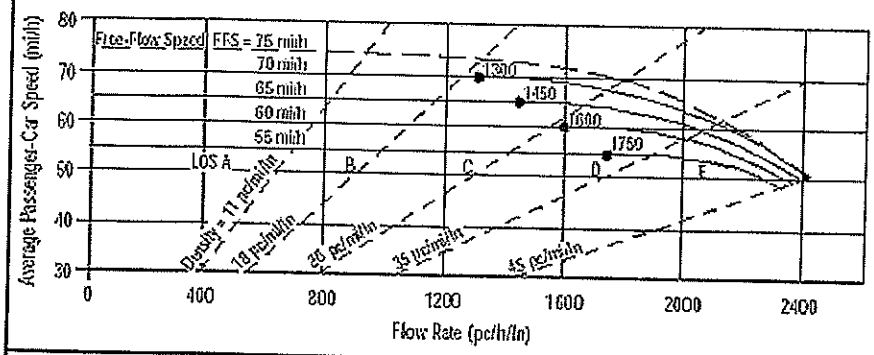
# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

## General Information

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Company | *HNTB* |
| Date Performed | *3/25/2008* |
| Analysis Time Period | *Peak* |

## Site Information

| | |
|---|---|
| Highway/Direction of Travel | *I-4/Eastbound* |
| From/To | *SR 46/US17/92* |
| Jurisdiction | |
| Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☑ Oper.(LOS) ☑ Des.(N) ☑ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *6120* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *9* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.957* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *0.67* | I/mi |
| Number of Lanes, N | *4* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *0.9* | mi/h |
| $f_N$ | *1.5* | mi/h |
| FFS | *67.6* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | *1683* | pc/h/ln |
| S | *66.9* | mi/h |
| D = $v_p$ / S | *25.2* | pc/mi/ln |
| LOS | *C* | |

## Design (N)

Design (N)

| | |
|---|---|
| Design LOS | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | pc/h |
| S | mi/h |
| D = $v_p$ / S | pc/mi/ln |
| Required Number of Lanes, N | |

## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |



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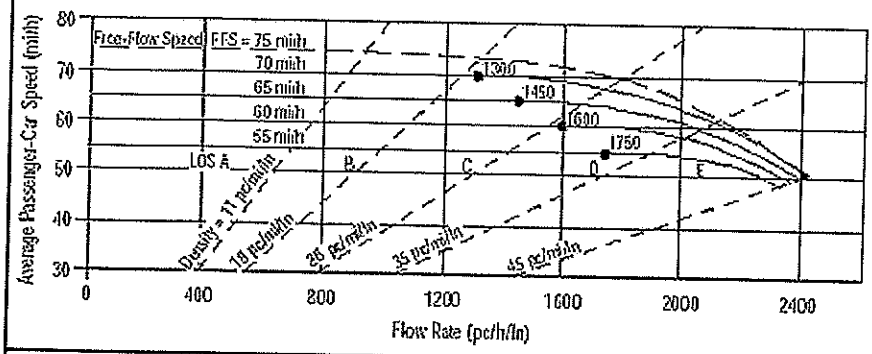
# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

## General Information

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Company | *HNTB* |
| Date Performed | *3/25/2008* |
| Analysis Time Period | *Peak* |

## Site Information

| | |
|---|---|
| Highway/Direction of Travel | *I-4/Eastbound* |
| From/To | *Us17/92 to Volusia County Line* |
| Jurisdiction | |
| Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *5650* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *9* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.957* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *2.00* | I/mi |
| Number of Lanes, N | *3* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *7.5* | mi/h |
| $f_N$ | *3.0* | mi/h |
| FFS | *59.5* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | *2072* | pc/h/ln |
| S | *56.5* | mi/h |
| D = $v_p$ / S | *36.7* | pc/mi/ln |
| LOS | *E* | |

## Design (N)

Design (N)

| | |
|---|---|
| Design LOS | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | pc/h |
| S | mi/h |
| D = $v_p$ / S | pc/mi/ln |
| Required Number of Lanes, N | |

## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |



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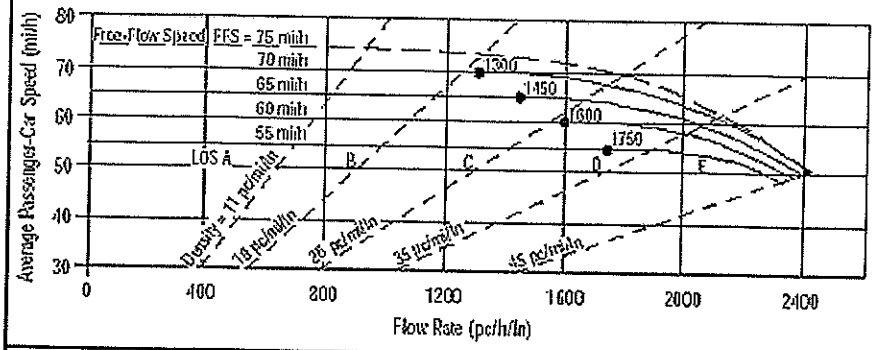
# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

## General Information

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Company | *HNTB* |
| Date Performed | *3/25/2008* |
| Analysis Time Period | *Peak* |

## Site Information

| | |
|---|---|
| Highway/Direction of Travel | *SR 417/Westbound* |
| From/To | *North of Rinehart Rd/Rinehart* |
| Jurisdiction | |
| Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *3690* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *10* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.952* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *0.40* | I/mi |
| Number of Lanes, N | *3* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *0.0* | mi/h |
| $f_N$ | *3.0* | mi/h |
| FFS | *67.0* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | *1359* | pc/h/ln |
| S | *67.0* | mi/h |
| D = $v_p$ / S | *20.3* | pc/mi/ln |
| LOS | *C* | |

## Design (N)

Design (N)

| | | |
|---|---|---|
| Design LOS | | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | | pc/h |
| S | | mi/h |
| D = $v_p$ / S | | pc/mi/ln |
| Required Number of Lanes, N | | |

## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |



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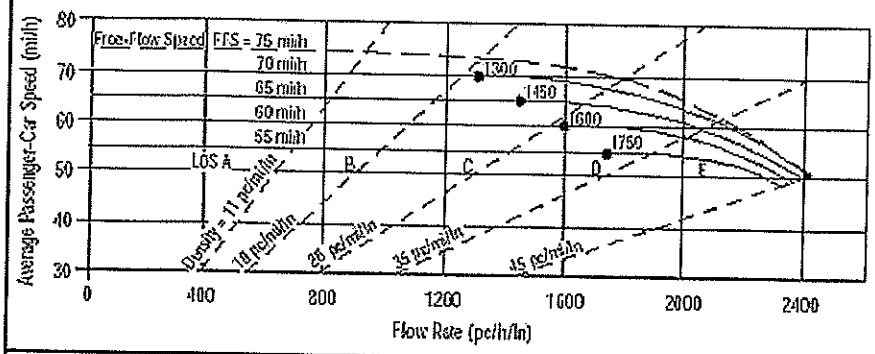
# BASIC FREEWAY SEGMENTS WORKSHEET




| Application | Input | Output |
|---|---|---|
| Operational (LOS) | FFS, N, $v_p$ | LOS, S, D |
| Design (N) | FFS, LOS, $v_p$ | N, S, D |
| Design ($v_p$) | FFS, LOS, N | $v_p$, S, D |
| Planning (LOS) | FFS, N, AADT | LOS, S, D |
| Planning (N) | FFS, LOS, AADT | N, S, D |
| Planning ($v_p$) | FFS, LOS, N | $v_p$, S, D |

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Highway/Direction of Travel | *SR 417/Westbound* |
| Agency or Company | *HNTB* | From/To | *Rinehart Rd to I-4* |
| Date Performed | *3/25/2008* | Jurisdiction | |
| Analysis Time Period | *Peak* | Analysis Year | *2022 No Build* |

Project Description Wekiva Parkway PD&E

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

## Flow Inputs

| | | | | |
|---|---|---|---|---|
| Volume, V | *2730* | veh/h | Peak-Hour Factor, PHF | *0.95* |
| AADT | | veh/day | %Trucks and Buses, $P_T$ | *10* |
| Peak-Hr Prop. of AADT, K | | | %RVs, $P_R$ | *0* |
| Peak-Hr Direction Prop, D | | | General Terrain: | *Level* |
| DDHV = AADT x K x D | | veh/h | Grade % Length | *mi* |
| Driver type adjustment | *1.00* | | Up/Down % | |

## Calculate Flow Adjustments

| | | | |
|---|---|---|---|
| $f_p$ | *1.00* | $E_R$ | *1.2* |
| $E_T$ | *1.5* | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | *0.952* |

## Speed Inputs

| | | |
|---|---|---|
| Lane Width | *12.0* | ft |
| Rt-Shoulder Lat. Clearance | *6.0* | ft |
| Interchange Density | *2.00* | l/mi |
| Number of Lanes, N | *3* | |
| FFS (measured) | | mi/h |
| Base free-flow Speed, BFFS | *70.0* | mi/h |

## Calc Speed Adj and FFS

| | | |
|---|---|---|
| $f_{LW}$ | *0.0* | mi/h |
| $f_{LC}$ | *0.0* | mi/h |
| $f_{ID}$ | *7.5* | mi/h |
| $f_N$ | *3.0* | mi/h |
| FFS | *59.5* | mi/h |

## LOS and Performance Measures

Operational (LOS)

| | | |
|---|---|---|
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) *1006* | | pc/h/ln |
| S | *59.5* | mi/h |
| D = $v_p$ / S | *16.9* | pc/mi/ln |
| LOS | *B* | |

## Design (N)

Design (N)

| | |
|---|---|
| Design LOS | |
| $v_p$ = (V or DDHV) / (PHF x N x $f_{HV}$ x $f_p$) | pc/h |
| S | mi/h |
| D = $v_p$ / S | pc/mi/ln |
| Required Number of Lanes, N | |

## Glossary

| | |
|---|---|
| N - Number of lanes | S - Speed |
| V - Hourly volume | D - Density |
| $v_p$ - Flow rate | FFS - Free-flow speed |
| LOS - Level of service | BFFS - Base free-flow speed |
| DDHV - Directional design hour volume | |

## Factor Location

| | |
|---|---|
| $E_R$ - Exhibits23-8, 23-10 | $f_{LW}$ - Exhibit 23-4 |
| $E_T$ - Exhibits 23-8, 23-10, 23-11 | $f_{LC}$ - Exhibit 23-5 |
| $f_p$ - Page 23-12 | $f_N$ - Exhibit 23-6 |
| LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3 | $f_{ID}$ - Exhibit 23-7 |



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SR 417WB on Ramp from Rinehart.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/31/2010 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | On Ramp from Rinehart Rd |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2460 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 270 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1290 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1700 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2460 | 270 | 1290 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 668 | 73 | 351 | v |
| Trucks and buses | 10 | 10 | 10 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.952 | 0.952 | 0.952 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 2808 308 1472 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = 317.02 (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1661 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3116 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1147 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 1661 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 1661 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.314

Space mean speed in ramp influence area, $S_R$ = 50.9 mph

Space mean speed in outer lanes, $S_O$ = 52.7 mph

Space mean speed for all vehicles, S = 51.5 mph

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Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/2010 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 EB |
| Junction: | Off Ramp to Rinehart Rd |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2730 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 270 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1070 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2400 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | |
|---|---|---|---|---|---|---|
| Volume, V (vph) | 2730 | | 270 | | 1070 | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | |
| Peak 15-min volume, v15 | 742 | | 73 | | 291 | v |
| Trucks and buses | 10 | | 10 | | 9 | % |
| Recreational vehicles | 0 | | 0 | | 0 | % |
| Terrain type: | Level | | Level | | Level | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.952 | | 0.952 | | 0.957 | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | |

Flow rate, vp 3116 308 1215 pcph

## Estimation of V12 Diverge Areas

$L_{EQ}$ = 0.00 (Equation 25-8 or 25-9)

$P_{FD}$ = 0.668 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2184 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3116 | 6750 | No |
| $v_{FO} = v_F - v_R$ | 2808 | 6750 | No |
| $v_R$ | 308 | 2000 | No |
| $v_3$ or $v_{av34}$ | 932 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 2184 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2184 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.456

Space mean speed in ramp influence area, $S_R$ = 49.1 mph

Space mean speed in outer lanes, $S_O$ = 60.3 mph

Space mean speed for all vehicles, $S$ = 52.0 mph

SR 417EB on Ramp from Rinehart.txt

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Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/2010 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 EB |
| Junction: | On Ramp from Rinehart Rd |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2460 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1070 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 270 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2400 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2460 | 1070 | 270 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 668 | 291 | 73 | v |
| Trucks and buses | 10 | 10 | 10 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.952 | 0.952 | 0.952 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

| | | | | |
|---|---|---|---|---|
| Flow rate, vp | 2808 | 1221 | 308 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 512.41 (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1661 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4029 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1147 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$/2 | | No | |

If yes, $v_{12A}$ = 1661 (Equation 25-8)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 1661 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.356

Space mean speed in ramp influence area, $S_R$ = 50.4 mph

Space mean speed in outer lanes, $S_O$ = 52.7 mph

Space mean speed for all vehicles, $S$ = 51.0 mph

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Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/2010 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | Off Ramp to Rinehart Rd |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3690 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1290 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 270 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1700 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | |
|---|---|---|---|---|---|---|
| Volume, V (vph) | 3690 | | 1290 | | 270 | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | |
| Peak 15-min volume, v15 | 1003 | | 351 | | 73 | v |
| Trucks and buses | 10 | | 10 | | 10 | % |
| Recreational vehicles | 0 | | 0 | | 0 | % |
| Terrain type: | Level | | Level | | Level | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.952 | | 0.952 | | 0.952 | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | |

Flow rate, vp 4211 1472 308 pcph

## Estimation of V12 Diverge Areas

$L_{EQ}$ = 0.00 (Equation 25-8 or 25-9)

$P_{FD}$ = 0.587 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3080 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4211 | 6750 | No |
| $v_{FO} = v_F - v_R$ | 2739 | 6750 | No |
| $v_R$ | 1472 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1131 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 3080 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3080 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.560

Space mean speed in ramp influence area, $S_R$ = 47.7 mph

Space mean speed in outer lanes, $S_O$ = 59.8 mph

Space mean speed for all vehicles, $S$ = 50.5 mph

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Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (East of I-4) EB |
| Junction: | Off Ramp to SR 417 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1540 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 430 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | No | |
| Volume on adjacent ramp | | vph |
| Position of adjacent ramp | | |
| Type of adjacent ramp | | |
| Distance to adjacent ramp | | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | |
|---|---|---|---|---|---|---|
| Volume, V (vph) | 1540 | | 430 | | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | | |
| Peak 15-min volume, v15 | 418 | | 117 | | | v |
| Trucks and buses | 9 | | 9 | | | % |
| Recreational vehicles | 0 | | 0 | | | % |
| Terrain type: | Level | | Level | | | |
| Grade | 0.00 | % | 0.00 | % | | % |
| Length | 0.00 | mi | 0.00 | mi | | mi |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | | |
| Heavy vehicle adjustment, fHV | 0.957 | | 0.957 | | | |
| Driver population factor, fP | 1.00 | | 1.00 | | | |

Flow rate, vp 1749 488 pcph

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1749 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 1749 | 4500 | No |
| $v_{FO} = v_F - v_R$ | 1261 | 4500 | No |
| $v_R$ | 488 | 2000 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 1749 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 1749 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 14.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.472

Space mean speed in ramp influence area, $S_R$ = 48.9 mph

Space mean speed in outer lanes, $S_O$ = N/A mph

Space mean speed for all vehicles, $S$ = 48.9 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | On Ramp from SR 46 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 760 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 740 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1770 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 4005 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 760 | 740 | 1770 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 207 | 201 | 481 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 863 | 841 | 2010 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 863 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 1704 | 4500 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 863 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 863 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 15.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.307

Space mean speed in ramp influence area, $S_R$ = 51.0 mph

Space mean speed in outer lanes, $S_O$ = N/A mph

Space mean speed for all vehicles, $S$ = 51.0 mph

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Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from SR 46 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 4870 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1250 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1160 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 5148 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 4870 | 1250 | 1160 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 1323 | 340 | 315 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 5532 1420 1318 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3272 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6952 | 6750 | Yes |
| $v_3$ or $v_{av34}$ | 2260 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ = 3272 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 3272 | 4600 | Yes |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 38.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.711 | |
| Space mean speed in ramp influence area, | $S_R$ = 45.8 | mph |
| Space mean speed in outer lanes, | $S_O$ = 48.7 | mph |
| Space mean speed for all vehicles, | $S$ = 46.7 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 NB |
| Junction: | Off Ramp to SR 46 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |

Description: Wekiva Parkway Project Development & Environment Study

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 5660 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1250 | vph |
| Length of first accel/decel lane | 1000 | ft |
| Length of second accel/decel lane | 1000 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1770 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 6098 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 5660 | | 1250 | | 1770 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 1572 | | 347 | | 492 | | v |
| Trucks and buses | 0 | | 0 | | 0 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 1.000 | | 1.000 | | 1.000 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |
| Flow rate, vp | 6289 | | 1389 | | 1967 | | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3594 pc/h

## Capacity Checks

| | | Actual | Maximum | LOS F? |
|---|---|---|---|---|
| $v_{Fi} = v_F$ | | 6289 | 6750 | No |
| $v_{FO} = v_F - v_R$ | | 4900 | 6750 | No |
| $v_R$ | | 1389 | 3800 | No |
| $v_3$ or $v_{av34}$ | | 2695 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_R$ /2 | | No | |

If yes, $v_{12A} = v_{3 \text{ or } av34} + v_{12}$ (Equation 25-18)

| Flow Entering Diverge Influence Area | | | |
|---|---|---|---|
| | Actual | Max Desirable | Violation? |
| $v_{12}$ | 3594 | 4600 | No ! |

**Level of Service Determination (if not F)**

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 8.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

**Speed Estimation**

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.553 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.8 | mph |
| Space mean speed in outer lanes, | $S_O$ = 53.7 | mph |
| Space mean speed for all vehicles, | $S$ = 50.2 | mph |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 EB |
| Junction: | On Ramp from I-4 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2300 ✓ | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 ✓ | mph |
| Volume on ramp | 430 ✓ | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1450 ✓ | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 2584 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2300 ✓ | 430 | 1450 | vph |
| Peak-hour factor, PHF | 0.92 ✓ | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 625 ✓ | 117 | 394 | v |
| Trucks and buses | 10 ✓ | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.952 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2625 | 488 | 1647 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2625 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3113 | 4500 | No |
| $v_{3 \text{ or } av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_{3 \text{ or } av34}$ > 2700 pc/h? | | No | |
| Is $v_{3 \text{ or } av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 2625 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2625 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.304 | |
| Space mean speed in ramp influence area, | $S_R$ = 51.1 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 51.1 | mph |

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Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/06/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from SR 417 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3710 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1160 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1250 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 5148 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3710 | 1160 | 1250 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 1008 | 315 | 340 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 4214 1318 1420 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2493 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 5532 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1721 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$/2 | | No | |
| If yes, $v_{12A}$ = 2493 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2493 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.462

Space mean speed in ramp influence area, $S_R$ = 49.0 mph

Space mean speed in outer lanes, $S_O$ = 50.6 mph

Space mean speed for all vehicles, $S$ = 49.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/06/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from SR 417 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3710 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1160 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 610 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 4826 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3710 | 1160 | 610 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 1008 | 315 | 166 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 4214 1318 693 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2493 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 5532 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1721 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 2493 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2493 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.462

Space mean speed in ramp influence area, $S_R$ = 49.0 mph

Space mean speed in outer lanes, $S_O$ = 50.6 mph

Space mean speed for all vehicles, $S$ = 49.5 mph

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | Off Ramp to I-4 SB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1510 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Left | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 430 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1160 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 3070 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 1510 | | 430 | | 1160 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 419 | | 119 | | 322 | | v |
| Trucks and buses | 0 | | 0 | | 0 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 1.000 | | 1.000 | | 1.000 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |
| Flow rate, vp | 1678 | | 478 | | 1289 | | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1678 pc/h

## Capacity Checks

| | | Actual | | Maximum | LOS F? |
|---|---|---|---|---|---|
| $v_{Fi} = v_F$ | | 1678 | | 4500 | No |
| $v_{FO} = v - v_R$ | | 1200 | | 4500 | No |
| $v_R$ | | 478 | | 2000 | No |
| $v_3$ or $v_{av34}$ | | 0 | pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | | | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | | | No | |

If yes, $v_{12A} = v_{3 \text{ or } av34} + v_{12}$ (Equation 25-18)

| Flow Entering Diverge Influence Area | | | |
|---|---|---|---|
| | Actual | Max Desirable | Violation? |
| $v_{12}$ | 1678 | 4600 | No |

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 5.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S = 0.471$ | |
| Space mean speed in ramp influence area, | $S_R = 48.9$ | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S = 48.9$ | mph |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 2/16/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 NB |
| Junction: | On Ramp from SR 417 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3710 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1160 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 610 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 4826 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3710 | 1160 | 610 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1031 | 322 | 169 | v |
| Trucks and buses | 0 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 1.000 | 1.000 | 1.000 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4122 | 1289 | 678 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.535 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 2203 pc/h

## Capacity Checks

| | | Actual | Maximum | LOS F? |
|---|---|---|---|---|
| $v_{FO}$ | | 5411 | 9000 | No |
| $v_{3 \text{ or } av34}$ | $v$ | 959 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_{3 \text{ or } av34}$ | $v$ > 2700 pc/h? | | No | |
| Is $v_{3 \text{ or } av34}$ | $v$ > 1.5 $v_{12}$/2 | | No | |
| If yes, $v_{12A}$ = | | | (Equation 25-8) | |

Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? | |
|---|---|---|---|---|
| $v_{12}$ | 2203 | 4400 | No | ! |

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.344 | |
| Space mean speed in ramp influence area, | $S_R$ = 50.5 | mph |
| Space mean speed in outer lanes, | $S_O$ = 53.3 | mph |
| Space mean speed for all vehicles, | $S$ = 51.5 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/06/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | Off Ramp to I-4 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2730 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1160 | vph |
| Length of first accel/decel lane | 600 | ft |
| Length of second accel/decel lane | 600 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 430 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 3070 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 2730 | | 1160 | | 430 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 742 | | 315 | | 117 | | v |
| Trucks and buses | 10 | | 10 | | 10 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.952 | 0.952 | 0.952 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3116 | 1324 | 491 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 2130 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3116 | 6750 | No |
| $v_{FO} = v - v_F - v_R$ | 1792 | 6750 | No |
| $v_R$ | 1324 | 3800 | No |
| $v_3$ or $v_{av34}$ | 986 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |

If yes, $v_{12A}$ = 2130 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2130 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.547 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.9 | mph |
| Space mean speed in outer lanes, | $S_O$ = 60.3 | mph |
| Space mean speed for all vehicles, | S = 51.2 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | Off Ramp to I-4 NB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |

Description: Wekiva Parkway Project Development & Environment Study

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 2670 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1160 | vph |
| Length of first accel/decel lane | 0 | ft |
| Length of second accel/decel lane | 500 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 430 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 3070 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 2670 | | 1160 | | 430 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 742 | | 322 | | 119 | | v |
| Trucks and buses | 0 | | 0 | | 0 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 1.000 | | 1.000 | | 1.000 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |
| Flow rate, vp | 2967 | | 1289 | | 478 | | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2044 pc/h

## Capacity Checks

| | | Actual | Maximum | LOS F? |
|---|---|---|---|---|
| $v_{Fi} = v_F$ | | 2967 | 6750 | No |
| $v_{FO} = v_F - v_R$ | | 1678 | 6750 | No |
| $v_R$ | | 1289 | 3800 | No |
| $v_3$ or $v_{av34}$ | | 923 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_R$ /2 | | No | |

If yes, $v_{12A} = v_{3 \text{ or } av34} + v_{12}$ (Equation 25-18)

| Flow Entering Diverge Influence Area | | | |
|---|---|---|---|
| | Actual | Max Desirable | Violation? |
| $v_{12}$ | 2044 | 4600 | No |

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.544 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.9 | mph |
| Space mean speed in outer lanes, | $S_O$ = 60.3 | mph |
| Space mean speed for all vehicles, | $S$ = 51.2 | mph |

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/06/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 EB |
| Junction: | On Ramp from I-4 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 850 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1450 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 430 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 2584 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 850 | 1450 | 430 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 231 | 394 | 117 | v |
| Trucks and buses | 10 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.952 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 970 1647 488 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 970 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2617 | 4500 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$/2 | | No | |
| If yes, $v_{12A}$ = 970 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 970 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.322 | |
| Space mean speed in ramp influence area, | $S_R$ = 50.8 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 50.8 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | Off Ramp to SR 417 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3270 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1450 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 710 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 4594 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 3270 | | 1450 | | 710 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 889 | | 394 | | 193 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3714 | 1647 | 806 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3714 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3714 | 4500 | No |
| $v_{FO} = v_F - v_R$ | 2067 | 4500 | No |
| $v_R$ | 1647 | 2000 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ | = 3714 | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3714 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 31.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D ✓

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.576

Space mean speed in ramp influence area, $S_R$ = 47.5 mph

Space mean speed in outer lanes, $S_O$ = N/A mph

Space mean speed for all vehicles, $S$ = 47.5 mph

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | Off Ramp to SR 417 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |

Description: Wekiva Parkway Project Development & Environment Study

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3270 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1450 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1770 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1954 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 3270 | | 1450 | | 1770 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 889 | | 394 | | 481 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3714 | 1647 | 2010 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3714 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3714 | 4500 | No |
| $v_{FO} = v - v_F - v_R$ | 2067 | 4500 | No |
| $v_R$ | 1647 | 2000 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |

If yes, $v_{12A}$ = 3714 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3714 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 31.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.576 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.5 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | S = 47.5 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/06/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | Off Ramp to CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 6160 ✓ | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1520 ✓ | vph |
| Length of first accel/decel lane | 0 | ft |
| Length of second accel/decel lane | 1500 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes ✓ | |
| Volume on adjacent ramp | 1540 ✓ | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 1906 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 6160 ✓ | | 1520 | | 1540 | | vph |
| Peak-hour factor, PHF | 0.92 ✓ | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 1674 ✓ | | 413 | | 418 | | v |
| Trucks and buses | 9 ✓ | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 6997 | 1727 | 1749 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3097 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 6997 | 9000 | No |
| $v_{FO} = v_F - v_R$ | 5270 | 9000 | No |
| $v_R$ | 1727 | 3800 | No |
| $v_3$ or $v_{av34}$ | 1950 pc/h | (Equation 25-15 or 25-16) | |

Is $v_3$ or $v_{av34}$ > 2700 pc/h? No

Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 No

If yes, $v_{12A}$ = 3097 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3097 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.583 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = 56.6 | mph |
| Space mean speed for all vehicles, | S = 52.1 | mph |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) SB |
| Junction: | On Ramp from SR 46 EB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1110 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1520 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 710 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1320 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 1110 | 1520 | 710 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 308 | 422 | 197 | v |
| Trucks and buses | 0 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, $E_T$ | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, $E_R$ | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, $f_{HV}$ | 1.000 | 1.000 | 1.000 | |
| Driver population factor, $f_P$ | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 1233 | 1689 | 789 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1233 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2922 | 4500 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? | |
|---|---|---|---|---|
| $v_{12}$ | 1233 | 4400 | No | ! |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.358 | |
| Space mean speed in ramp influence area, | $S_R$ = 50.3 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | S = 50.3 | mph |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3100 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 610 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1160 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 4826 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3100 | 610 | 1160 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 842 | 166 | 315 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3521 | 693 | 1318 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.619 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2181 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4214 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1340 pc/h | (Equation 25-4 or 25-5) | |

Is $v_3$ or $v_{av34}$ > 2700 pc/h? No

Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 No

If yes, $v_{12A}$ = 2181 (Equation 25-8)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2181 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.285

Space mean speed in ramp influence area, $S_R$ = 51.3 mph

Space mean speed in outer lanes, $S_O$ = 52.0 mph

Space mean speed for all vehicles, $S$ = 51.5 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3100 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 610 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1540 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 5418 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3100 | 610 | 1540 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 842 | 166 | 418 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3521 | 693 | 1749 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 996.00 (Equation 25-2 or 25-3)

$P_{FM}$ = 0.619 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2181 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4214 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1340 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 2181 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2181 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.285

Space mean speed in ramp influence area, $S_R$ = 51.3 mph

Space mean speed in outer lanes, $S_O$ = 52.0 mph

Space mean speed for all vehicles, $S$ = 51.5 mph

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | Off Ramp to CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1820 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 710 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1520 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1320 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 1820 | | 710 | | 1520 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 495 | | 193 | | 413 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2067 | 806 | 1727 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2067 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 2067 | 4500 | No |
| $v_{FO} = v_F - v_R$ | 1261 | 4500 | No |
| $v_R$ | 806 | 2000 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |

If yes, $v_{12A}$ = 2067 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2067 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.501 | |
| Space mean speed in ramp influence area, | $S_R$ = 48.5 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 48.5 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | Off Ramp to CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1820 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 710 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1450 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 4594 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 1820 | | 710 | | 1450 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 495 | | 193 | | 394 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2067 | 806 | 1647 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2067 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 2067 | 4500 | No |
| $v_{FO} = v_F - v_R$ | 1261 | 4500 | No |
| $v_R$ | 806 | 2000 | No |
| $v_{3 \text{ or } av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_{3 \text{ or } av34}$ | > 2700 pc/h? | No | |
| Is $v_{3 \text{ or } av34}$ | > 1.5 $v_{12}$ /2 | No | |

If yes, $v_{12A}$ = 2067 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2067 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.501 | |
| Space mean speed in ramp influence area, | $S_R$ = 48.5 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 48.5 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | Off Ramp to SR 417 EB & SR 46 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 4640 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1540 | vph |
| Length of first accel/decel lane | 575 | ft |
| Length of second accel/decel lane | 575 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1520 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 1906 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 4640 | | 1540 | | 1520 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 1261 | | 418 | | 413 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5270 | 1749 | 1727 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3333 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 5270 | 6750 | No |
| $v_{FO} = v_F - v_R$ | 3521 | 6750 | No |
| $v_R$ | 1749 | 3800 | No |
| $v_3$ or $v_{av34}$ | 1937 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 3333 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3333 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.585 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = 56.7 | mph |
| Space mean speed for all vehicles, | S = 50.4 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 NB |
| Junction: | Off Ramp to SR 417 EB & CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 4410 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1770 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | 500 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1250 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 6098 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 4410 | | 1770 | | 1250 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 1225 | | 492 | | 347 | | v |
| Trucks and buses | 0 | | 0 | | 0 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 1.000 | | 1.000 | | 1.000 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |
| Flow rate, vp | 4900 | | 1967 | | 1389 | | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3287 pc/h

## Capacity Checks

| | | Actual | Maximum | LOS F? |
|---|---|---|---|---|
| $v_{Fi} = v_F$ | | 4900 | 6750 | No |
| $v_{FO} = v - v_R$ | | 2933 | 6750 | No |
| $v_R$ | | 1967 | 3800 | No |
| $v_3$ or $v_{av34}$ | | 1613 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_R$ /2 | | No | |

If yes, $v_{12A}$ = $v_{3 \text{ or } av34}$ (Equation 25-18)

| Flow Entering Diverge Influence Area | | | |
|---|---|---|---|
| | Actual | Max Desirable | Violation? |
| $v_{12}$ | 3287 | 4600 | No |

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.605 | |
| Space mean speed in ramp influence area, | $S_R$ = 47.1 | mph |
| Space mean speed in outer lanes, | $S_O$ = 57.9 | mph |
| Space mean speed for all vehicles, | $S$ = 50.2 | mph |

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | On Ramp from I-4 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1500 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Left | |
| Number of lanes in ramp | 2 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1770 | vph |
| Length of first accel/decel lane | 1300 | ft |
| Length of second accel/decel lane | 1300 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 740 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 4005 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 1500 | 1770 | 740 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 408 | 481 | 201 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, $v_p$ 1704 2010 841 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1704 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3714 | 4500 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 1704 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 1704 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.244

Space mean speed in ramp influence area, $S_R$ = 51.8 mph

Space mean speed in outer lanes, $S_O$ = N/A mph

Space mean speed for all vehicles, $S$ = 51.8 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 NB |
| Junction: | On Ramp from SR 46 & CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3070 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 2630 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | 750 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 430 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 3654 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3070 | 2630 | 430 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 853 | 731 | 119 | v |
| Trucks and buses | 0 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 1.000 | 1.000 | 1.000 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3411 | 2922 | 478 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.209 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 713 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6333 | 9000 | No |
| $v_3$ or $v_{av34}$ | 1349 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | Yes | |
| If yes, $v_{12A}$ = 1364 | | (Equation 25-8) | |

Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? | |
|---|---|---|---|---|
| $v_{12A}$ | 1364 | 4400 | No | ! |

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.447 | |
| Space mean speed in ramp influence area, | $S_R$ = 49.2 | mph |
| Space mean speed in outer lanes, | $S_O$ = 53.1 | mph |
| Space mean speed for all vehicles, | $S$ = 50.4 | mph |

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 WB |
| Junction: | Off Ramp to I-4 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1570 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Left | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 430 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1160 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 3070 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 1570 | | 430 | | 1160 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 427 | | 117 | | 315 | | v |
| Trucks and buses | 10 | | 10 | | 10 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 0.952 | | 0.952 | | 0.952 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |

Flow rate, vp 1792 491 1324 pcph

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1792 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 1792 | 4500 | No |
| $v_{FO} = v_F - v_R$ | 1301 | 4500 | No |
| $v_R$ | 491 | 2000 | No |
| $v_{3 \text{ or } av34}$ | 0 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_{3 \text{ or } av34}$ | > 2700 pc/h? | No | |
| Is $v_{3 \text{ or } av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ = 1792 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 1792 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.472

Space mean speed in ramp influence area, $S_R$ = 48.9 mph

Space mean speed in outer lanes, $S_O$ = N/A mph

Space mean speed for all vehicles, $S$ = 48.9 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 3/09/07 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | SR 417 EB |
| Junction: | On Ramp from I-4 SB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |

Description: Wekiva Parkway Project Development & Environment Study

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 850 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1450 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 430 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 2584 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 850 | 1450 | 430 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 236 | 403 | 119 | v |
| Trucks and buses | 0 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 1.000 | 1.000 | 1.000 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 944 | 1611 | 478 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 944 pc/h

## Capacity Checks

| | | Actual | Maximum | LOS F? |
|---|---|---|---|---|
| $v_{FO}$ | | 2555 | 4500 | No |
| $v_{3 or av34}$ | | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_{3 or av34}$ | > 2700 pc/h? | | No | |
| Is $v_{3 or av34}$ | > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = | | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 944 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.319 | |
| Space mean speed in ramp influence area, | $S_R$ = 50.9 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 50.9 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | Off Ramp to US 17/92 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 70.0 | mph |
| Volume on freeway | 6120 ✓ | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 ✓ | mph |
| Volume on ramp | 830 ✓ | vph |
| Length of first accel/decel lane | 1045 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 360 ✓ | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1948 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 6120 ✓ | | 830 | | 360 | | vph |
| Peak-hour factor, PHF | 0.92 ✓ | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 1663 ✓ | | 226 | | 98 | | v |
| Trucks and buses | 9 ✓ | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 6952 | 943 | 409 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3563 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 6952 | 9600 | No |
| $v_{FO} = v_F - v_R$ | 6009 | 9600 | No |
| $v_R$ | 943 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1694 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 3563 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3563 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 25.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.513

Space mean speed in ramp influence area, $S_R$ = 55.6 mph

Space mean speed in outer lanes, $S_O$ = 74.1 mph

Space mean speed for all vehicles, S = 63.3 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 EB |
| Junction: | On Ramp from US 17/92 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 70.0 | mph |
| Volume on freeway | 5290 ✓ | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 360 ✓ | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes ✓ | |
| Volume on adjacent Ramp | 830 ✓ | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1948 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 5290 | 360 | 830 | vph |
| Peak-hour factor, PHF | 0.92 ✓ | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 1437 ✓ | 98 | 226 | v |
| Trucks and buses | 9 ✓ | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 6009 | 409 | 943 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 1023.65 (Equation 25-2 or 25-3)

$P_{FM}$ = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3554 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6418 | 7200 | No |
| $v_3$ or $v_{av34}$ | 2455 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ | = 3554 | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 3554 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 33.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D ✓

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.491

Space mean speed in ramp influence area, $S_R$ = 56.2 mph

Space mean speed in outer lanes, $S_O$ = 62.5 mph

Space mean speed for all vehicles, $S$ = 58.5 mph

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | Off Ramp to US 17/92 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 70.0 | mph |
| Volume on freeway | 5650 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 360 | vph |
| Length of first accel/decel lane | 600 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 830 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1948 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | |
|---|---|---|---|---|---|---|
| Volume, V (vph) | 5650 | | 360 | | 830 | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | |
| Peak 15-min volume, v15 | 1535 | | 98 | | 226 | v |
| Trucks and buses | 9 | | 9 | | 9 | % |
| Recreational vehicles | 0 | | 0 | | 0 | % |
| Terrain type: | Level | | Level | | Level | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 6418 | 409 | 943 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.581 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3899 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 6418 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 6009 | 7200 | No |
| $v_R$ | 409 | 2000 | No |
| $v_3$ or $v_{av34}$ | 2519 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |

If yes, $v_{12A}$ = 3899 (Equation 25-18)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3899 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D ✓

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.465

Space mean speed in ramp influence area, $S_R$ = 57.0 mph

Space mean speed in outer lanes, $S_O$ = 70.9 mph

Space mean speed for all vehicles, $S$ = 61.7 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 08/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | On Ramp from US 17/92 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |

Description: Wekiva Parkway Project Development & Environment Study

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 70.0 ✓ | mph |
| Volume on freeway | 5290 ✓ | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 830 ✓ | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 360 ✓ | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1948 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 5290 ✓ | 830 | 360 | vph |
| Peak-hour factor, PHF | 0.92 ✓ | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 1437 | 226 | 98 | v |
| Trucks and buses | 9 ✓ | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 6009 | 943 | 409 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.100 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 600 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6952 | 9600 | No |
| $v_3$ or $v_{av34}$ | 2704 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | Yes | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | Yes | |
| If yes, $v_{12A}$ = 2403 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 2403 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.0+ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D ✓

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.397

Space mean speed in ramp influence area, $S_R$ = 58.9 mph

Space mean speed in outer lanes, $S_O$ = 65.3 mph

Space mean speed for all vehicles, $S$ = 62.1 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | Frontage Rd (West of I-4) WB |
| Junction: | On Ramp from CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 1110 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1520 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 710 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1320 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 1110 | 1520 | 710 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 302 | 413 | 193 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 1261 | 1727 | 806 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 1261 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2988 | 4500 | No |
| $v_3$ or $v_{av34}$ | 0 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 1261 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 1261 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A =$ 24.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.363 | |
| Space mean speed in ramp influence area, | $S_R$ = 50.3 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 50.3 | mph |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | Off Ramp to SR 417 EB & CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 4870 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1770 | vph |
| Length of first accel/decel lane | 500 | ft |
| Length of second accel/decel lane | 500 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1250 | vph |
| Position of adjacent ramp | Upstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 6098 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 4870 | | 1770 | | 1250 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 1323 | | 481 | | 340 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5532 | 2010 | 1420 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3595 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 5532 | 6750 | No |
| $v_{FO} = v_F - v_R$ | 3522 | 6750 | No |
| $v_R$ | 2010 | 3800 | No |
| $v_3$ or $v_{av34}$ | 1937 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ = 3595 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3595 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.609

Space mean speed in ramp influence area, $S_R$ = 47.1 mph

Space mean speed in outer lanes, $S_O$ = 56.7 mph

Space mean speed for all vehicles, $S$ = 50.1 mph

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | On Ramp from SR 417 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3100 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 430 | vph |
| Length of first accel/decel lane | 900 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 2630 | vph |
| Position of adjacent Ramp | Downstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 3654 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3100 | 430 | 2630 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 842 | 117 | 715 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3521 | 488 | 2987 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2122 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4009 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1399 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | No | |
| If yes, $v_{12A}$ = 2122 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2122 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.311 | |
| Space mean speed in ramp influence area, | $S_R$ = 51.0 | mph |
| Space mean speed in outer lanes, | $S_O$ = 51.8 | mph |
| Space mean speed for all vehicles, | S = 51.2 | mph |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | On Ramp from SR 417 WB |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3100 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 430 | vph |
| Length of first accel/decel lane | 900 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1770 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 3490 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3100 | 430 | 1770 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 842 | 117 | 481 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|---|---|---|---|---|
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3521 | 488 | 2010 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 685.73 (Equation 25-2 or 25-3)

$P_{FM}$ = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2122 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4009 | 6750 | No |
| $v_3$ or $v_{av34}$ | 1399 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ > 2700 pc/h? | | No | |
| Is $v_3$ or $v_{av34}$ > 1.5 $v_{12}$ /2 | | No | |
| If yes, $v_{12A}$ = 2122 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2122 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.311 | |
| Space mean speed in ramp influence area, | $S_R$ = 51.0 | mph |
| Space mean speed in outer lanes, | $S_O$ = 51.8 | mph |
| Space mean speed for all vehicles, | $S$ = 51.2 | mph |

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | On Ramp from SR 46 & CR 46A |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 3530 | vph |

## On Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-flow speed on ramp | 35.0 | mph |
| Volume on ramp | 2630 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | 750 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 430 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 3654 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3530 | 2630 | 430 | vph |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 959 | 715 | 117 | v |
| Trucks and buses | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |

Flow rate, vp 4010 2987 488 pcph

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 25-2 or 25-3)

$P_{FM}$ = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2226 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6997 | 6750 | Yes |
| $v_3$ or $v_{av34}$ | 1784 pc/h | (Equation 25-4 or 25-5) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$ /2 | Yes | |
| If yes, $v_{12A}$ = 2291 | | (Equation 25-8) | |

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 2291 | 4600 | Yes |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.928 | |
| Space mean speed in ramp influence area, | $S_R$ = 42.9 | mph |
| Space mean speed in outer lanes, | $S_O$ = 50.6 | mph |
| Space mean speed for all vehicles, | $S$ = 44.6 | mph |

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date performed: | 8/05/10 |
| Analysis time period: | No Build |
| Freeway/Dir of Travel: | I-4 WB |
| Junction: | Off Ramp to SR 46 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway Project Development & Environment Study |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 4 | |
| Free-flow speed on freeway | 55.0 | mph |
| Volume on freeway | 6120 | vph |

## Off Ramp Data

| | | |
|---|---|---|
| Side of freeway | Right | |
| Number of lanes in ramp | 2 | |
| Free-Flow speed on ramp | 35.0 | mph |
| Volume on ramp | 1250 | vph |
| Length of first accel/decel lane | 0 | ft |
| Length of second accel/decel lane | 500 | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 1770 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 6098 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 6120 | | 1250 | | 1770 | | vph |
| Peak-hour factor, PHF | 0.92 | | 0.92 | | 0.92 | | |
| Peak 15-min volume, v15 | 1663 | | 340 | | 481 | | v |
| Trucks and buses | 9 | | 9 | | 9 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 0.00 | mi | 0.00 | mi | |
| Trucks and buses PCE, ET | 1.5 | | 1.5 | | 1.5 | | |
| Recreational vehicle PCE, ER | 1.2 | | 1.2 | | 1.2 | | |
| Heavy vehicle adjustment, fHV | 0.957 | | 0.957 | | 0.957 | | |
| Driver population factor, fP | 1.00 | | 1.00 | | 1.00 | | |

Flow rate, vp 6952 1420 2010 pcph

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 25-8 or 25-9)

$P_{FD}$ = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2858 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 6952 | 9000 | No |
| $v_{FO} = v_F - v_R$ | 5532 | 9000 | No |
| $v_R$ | 1420 | 3800 | No |
| $v_3$ or $v_{av34}$ | 2047 pc/h | (Equation 25-15 or 25-16) | |
| Is $v_3$ or $v_{av34}$ | > 2700 pc/h? | No | |
| Is $v_3$ or $v_{av34}$ | > 1.5 $v_{12}$/2 | No | |
| If yes, $v_{12A}$ = 2858 | | (Equation 25-18) | |

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2858 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.556

Space mean speed in ramp influence area, $S_R$ = 47.8 mph

Space mean speed in outer lanes, $S_O$ = 56.3 mph

Space mean speed for all vehicles, $S$ = 52.4 mph

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency or Company: | HNTB |
| Date Performed: | 8/10/2010 |
| Analysis Time Period: | No-Build |
| Freeway/Direction: | I-4 WB |
| From/To: | On Ramp from CR 46A & SR 46 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway PD&E |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 6160 | veh/h |
| Peak-hour factor, PHF | 0.92 | |
| Peak 15-min volume, v15 | 1674 | v |
| Trucks and buses | 9 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | 0.00 | % |
| Segment length | 0.00 | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1749 | pc/h/ln |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-shoulder lateral clearance | 6.0 | ft |
| Interchange density | 0.90 | interchange/mi |
| Number of lanes, N | 4 | |
| Free-flow speed: | Base | |
| FFS or BFFS | 70.0 | mi/h |
| Lane width adjustment, fLW | 0.0 | mi/h |
| Lateral clearance adjustment, fLC | 0.0 | mi/h |
| Interchange density adjustment, fID | 2.0 | mi/h |
| Number of lanes adjustment, fN | 1.5 | mi/h |
| Free-flow speed, FFS | 66.5 | mi/h |
| | Urban Freeway | |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1749 | pc/h/ln |
| Free-flow speed, FFS | 66.5 | mi/h |
| Average passenger-car speed, S | 65.5 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 26.7 | pc/mi/ln |
| Level of service, LOS | D | |

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date Performed: | 3/09/07 |
| Analysis Time Period: | No-Build |
| Freeway/Dir of Travel: | I-4 WB |
| Weaving Location: | I-4 WB CD Road |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway PD&E |

## Inputs

| | | |
|---|---|---|
| Freeway free-flow speed, SFF | 65 | mph |
| Weaving number of lanes, N | 3 | |
| Weaving segment length, L | 1954 | ft |
| Terrain type | Level | |
| Grade | | % |
| Length | | mi |
| Weaving type | B | Multilane or C-D |
| Volume ratio, VR | 0.72 | |
| Weaving ratio, R | 0.49 | |

## Conversion to pc/h Under Base Conditions

| | Non-Weaving V A-C | Non-Weaving V B-D | Weaving V A-D | Weaving V B-C | |
|---|---|---|---|---|---|
| Volume, V | 610 | 290 | 1160 | 1210 | veh/h |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 169 | 81 | 322 | 336 | v |
| Trucks and buses | 0 | 0 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 1.000 | 1.000 | 1.000 | 1.000 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 677 | 322 | 1288 | 1344 | pc/h |

## Weaving and Non-Weaving Speeds

| | Weaving | Non-Weaving |
|---|---|---|
| a (Exhibit 24-6) | 0.08 | 0.0020 |
| b (Exhibit 24-6) | 2.20 | 6.00 |
| c (Exhibit 24-6) | 0.70 | 1.00 |
| d (Exhibit 24-6) | 0.50 | 0.50 |
| Weaving intensity factor, Wi | 0.86 | 1.44 |
| Weaving and non-weaving speeds, Si | 44.51 | 37.52 |
| Number of lanes required for unconstrained operation, Nw (Exhibit 24-7) | | 2.52 |
| Maximum number of lanes, Nw (max) (Exhibit 24-7) | | 3.50 |
| Type of operation is | | Unconstrained |

## Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 42.34 | mph |
| Weaving segment density, D | 28.59 | pc/mi/ln |
| Level of service, LOS | C | |
| Capacity of base condition, cb | 5015 | pc/h |
| Capacity as a 15-minute flow rate, c | 5015 | pc/h |
| Capacity as a full-hour volume, ch | 4513 | pc/h |

## Limitations on Weaving Segments

| | Analyzed | If Max Exceeded Maximum | See Note |
|---|---|---|---|
| Weaving flow rate, Vw | 2632 | 4000 | a |
| Average flow rate (pcphpl) | 1210 | 2350 | b |
| Volume ratio, VR | 0.72 | 0.80 | c |
| Weaving ratio, R | 0.49 | N/A | d |
| Weaving length (ft) | 1954 | 2500 | e |

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS+: Freeway Weaving Release 5.4

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | CTR |
| Agency/Co.: | HNTB |
| Date Performed: | 8/06/10 |
| Analysis Time Period: | No-Build |
| Freeway/Dir of Travel: | I-4 WB CD Road |
| Weaving Location: | SR 46 to SR 417 |
| Jurisdiction: | Seminole County |
| Analysis Year: | 2022 |
| Description: | Wekiva Parkway PD&E |

## Inputs

| | | |
|---|---|---|
| Freeway free-flow speed, SFF | 65 | mph |
| Weaving number of lanes, N | 3 | |
| Weaving segment length, L | 1954 | ft |
| Terrain type | Level | |
| Grade | | % |
| Length | | mi |
| Weaving type | B | Multilane or C-D |
| Volume ratio, VR | 0.72 | |
| Weaving ratio, R | 0.49 | |

## Conversion to pc/h Under Base Conditions

| | Non-Weaving | | Weaving | | |
|---|---|---|---|---|---|
| | $V_{o1}$ | $V_{o2}$ | $V_{w1}$ | $V_{w2}$ | |
| Volume, V | 610 | 290 | 1160 | 1210 | veh/h |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | |
| Peak 15-min volume, v15 | 166 | 79 | 315 | 329 | v |
| Trucks and buses | 9 | 9 | 9 | 9 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.957 | 0.957 | 0.957 | 0.957 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 692 | 329 | 1317 | 1374 | pc/h |

## Weaving and Non-Weaving Speeds

| | Weaving | Non-Weaving |
|---|---|---|
| a (Exhibit 24-6) | 0.08 | 0.0020 |
| b (Exhibit 24-6) | 2.20 | 6.00 |
| c (Exhibit 24-6) | 0.70 | 1.00 |
| d (Exhibit 24-6) | 0.50 | 0.50 |
| Weaving intensity factor, Wi | 0.88 | 1.47 |
| Weaving and non-weaving speeds, Si | 44.29 | 37.22 |
| Number of lanes required for | | |

| | |
|---|---|
| unconstrained operation, Nw (Exhibit 24-7) | 2.53 |
| Maximum number of lanes, Nw (max) (Exhibit 24-7) | 3.50 |
| Type of operation is | Unconstrained |

## Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 42.09 | mph |
| Weaving segment density, D | 29.39 | pc/mi/ln |
| Level of service, LOS | C | |
| Capacity of base condition, cb | 5015 | pc/h |
| Capacity as a 15-minute flow rate, c | 4799 | pc/h |
| Capacity as a full-hour volume, ch | 4415 | pc/h |

## Limitations on Weaving Segments

| | Analyzed | If Max Exceeded Maximum | See Note Note |
|---|---|---|---|
| Weaving flow rate, Vw | 2691 | 4000 | a |
| Average flow rate (pcphpl) | 1237 | 2350 | b |
| Volume ratio, VR | 0.72 | 0.80 | c |
| Weaving ratio, R | 0.49 | N/A | d |
| Weaving length (ft) | 1954 | 2500 | e |

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

| | |
|---|---|
| Analyst | KNM |
| Agency or Company | HNTB |
| Date Performed | 03/24/08 |
| Analysis Time Period | No Build |

## Site Information

| | |
|---|---|
| Freeway/Dir of Travel | I-4 WB |
| Junction | Off Ramp to US 1792 |
| Jurisdiction | Seminole County |
| Analysis Year | 2022 |

Project Description: Wekiva Parkway Project Development & Environment Study

## Inputs

Upstream Adj Ramp
☒ Yes ☒ On
☒ No ☐ Off
$L_{up}$ = ft
$V_u$ = veh/h

Terrain: Level

$S_{FF}$ = 70.0 mph $S_{FR}$ = 35.0 mph

Sketch ( show lanes, $L_A$, $L_D$, $V_R$, $V_f$)

Downstream Adj Ramp
☒ Yes ☒ On
☐ No ☐ Off
$L_{down}$ = 1948 ft
$V_D$ = 830 veh/h

## Conversion to pc/h Under Base Conditions

| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | $f_{HV}$ | $f_p$ | v = V/PHF x $f_{HV}$ x $f_p$ |
|---|---|---|---|---|---|---|---|---|
| Freeway | 5220 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 5742 |
| Ramp | 360 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 396 |
| UpStream | | | | | | | | |
| DownStream | 830 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 913 |

### Merge Areas

#### Estimation of $v_{12}$

$V_{12} = V_F ( P_{FM} )$

$L_{EQ}$ = (Equation 25-2 or 25-3)
$P_{FM}$ = using Equation (Exhibit 25-5)
$V_{12}$ = pc/h
$V_3$ or $V_{av34}$ pc/h (Equation 25-4 or 25-5)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☒ Yes ☐ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☒ Yes ☐ No
If Yes, $V_{12a}$ = pc/h (Equation 25-8)

#### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_{FO}$ | | Exhibit 25-7 | | |

#### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{R12}$ | | Exhibit 25-7 | | |

#### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

$D_R$ = (pc/mi/ln)
LOS = (Exhibit 25-4)

#### Speed Determination

$M_S$ = (Exibit 25-19)
$S_R$ = mph (Exhibit 25-19)

### Diverge Areas

#### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ}$ = (Equation 25-8 or 25-9)
$P_{FD}$ = 0.598 using Equation (Exhibit 25-12)
$V_{12}$ = 3594 pc/h
$V_3$ or $V_{av34}$ 2148 pc/h (Equation 25-15 or 25-16)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☐ Yes ☒ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☐ Yes ☒ No
If Yes, $V_{12a}$ = pc/h (Equation 25-18)

#### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_F$ | 5742 | Exhibit 25-14 | 7200 | No |
| $V_{FO} = V_F - V_R$ | 5346 | Exhibit 25-14 | 7200 | No |
| $V_R$ | 396 | Exhibit 25-3 | 2000 | No |

#### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{12}$ | 3594 | Exhibit 25-14 | 4400:All | No |

#### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

$D_R$ = 29.8 (pc/mi/ln)
LOS = D (Exhibit 25-4)

#### Speed Determination

$D_s$ = 0.464 (Exhibit 25-19)
$S_R$ = 57.0 mph (Exhibit 25-19)
72.3 mph (Exhibit 25-19)

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

| | |
|---|---|
| Analyst | KNM |
| Agency or Company | HNTB |
| Date Performed | 03/24/08 |
| Analysis Time Period | No Build |

## Site Information

| | |
|---|---|
| Freeway/Dir of Travel | I-4 WB |
| Junction | On Ramp from US 1792 |
| Jurisdiction | Seminole County |
| Analysis Year | 2022 |

Project Description: Wekiva Parkway Project Development & Environment Study

## Inputs

Upstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
$L_{up}$ = 1948 ft
$V_u$ = 360 veh/h

Terrain: Level

$S_{FF}$ = 70.0 mph $S_{FR}$ = 35.0 mph

Sketch ( show lanes, $L_A$, $L_D$, $V_R$, $V_f$)

Downstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
$L_{down}$ = ft
$V_D$ = veh/h

## Conversion to pc/h Under Base Conditions

| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | $f_{HV}$ | $f_p$ | $v = V/PHF \times f_{HV} \times f_p$ |
|---|---|---|---|---|---|---|---|---|
| Freeway | 4860 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 5346 |
| Ramp | 830 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 913 |
| UpStream | 360 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 396 |
| DownStream | | | | | | | | |

## Merge Areas

### Estimation of $v_{12}$

$V_{12} = V_F ( P_{FM} )$

$L_{EQ}$ = (Equation 25-2 or 25-3)
$P_{FM}$ = 0.263 using Equation (Exhibit 25-5)
$V_{12}$ = 1406 pc/h
$V_3$ or $V_{av34}$ 1970 pc/h (Equation 25-4 or 25-5)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☒ Yes ☒ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☒ Yes ☒ No
If Yes, $V_{12a}$ = 2138 pc/h (Equation 25-8)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_{FO}$ | 6259 | Exhibit 25-7 | | No |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{R12}$ | 3051 | Exhibit 25-7 | 4600:All | No |

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

$D_R$ = 25.7 (pc/mi/ln)
LOS = C (Exhibit 25-4)

### Speed Determination

$M_S$ = 0.368 (Exibit 25-19)
$S_R$ = 59.7 mph (Exhibit 25-19)

## Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ}$ = (Equation 25-8 or 25-9)
$P_{FD}$ = using Equation (Exhibit 25-12)
$V_{12}$ = pc/h
$V_3$ or $V_{av34}$ pc/h (Equation 25-15 or 25-16)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☒ Yes ☒ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☒ Yes ☒ No
If Yes, $V_{12a}$ = pc/h (Equation 25-18)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_F$ | | Exhibit 25-14 | | |
| $V_{FO} = V_F - V_R$ | | Exhibit 25-14 | | |
| $V_R$ | | Exhibit 25-3 | | |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{12}$ | | Exhibit 25-14 | | |

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

$D_R$ = (pc/mi/ln)
LOS = (Exhibit 25-4)

### Speed Determination

$D_s$ = (Exhibit 25-19)
$S_R$ = mph (Exhibit 25-19)

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

| | |
|---|---|
| Analyst | KNM |
| Agency or Company | HNTB |
| Date Performed | 03/24/08 |
| Analysis Time Period | No Build |

## Site Information

| | |
|---|---|
| Freeway/Dir of Travel | I-4 EB |
| Junction | Off Ramp to US 1792 |
| Jurisdiction | Seminole County |
| Analysis Year | 2022 |

Project Description: Wekiva Parkway Project Development & Environment Study

## Inputs

Upstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
$L_{up}$ = ft
$V_u$ = veh/h

Terrain: Level

$S_{FF}$ = 70.0 mph $S_{FR}$ = 35.0 mph

Sketch ( show lanes, $L_A$, $L_D$, $V_R$, $V_f$)

Downstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
$L_{down}$ = 1948 ft
$V_D$ = 360 veh/h

## Conversion to pc/h Under Base Conditions

| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | $f_{HV}$ | $f_p$ | $v = V/PHF \times f_{HV} \times f_p$ |
|---|---|---|---|---|---|---|---|---|
| Freeway | 6120 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 6732 |
| Ramp | 830 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 913 |
| UpStream | | | | | | | | |
| DownStream | 360 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 396 |

## Merge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$

$L_{EQ}$ = (Equation 25-2 or 25-3)
$P_{FM}$ = using Equation (Exhibit 25-5)
$V_{12}$ = pc/h
$V_3$ or $V_{av34}$ pc/h (Equation 25-4 or 25-5)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☒ Yes ☒ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☒ Yes ☒ No
If Yes, $V_{12a}$ = pc/h (Equation 25-8)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_{FO}$ | | Exhibit 25-7 | | |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{R12}$ | | Exhibit 25-7 | | |

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

$D_R$ = (pc/mi/ln)
LOS = (Exhibit 25-4)

### Speed Determination

$M_S$ = (Exibit 25-19)
$S_R$ = mph (Exhibit 25-19)

## Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ}$ = (Equation 25-8 or 25-9)
$P_{FD}$ = 0.436 using Equation (Exhibit 25-12)
$V_{12}$ = 3450 pc/h
$V_3$ or $V_{av34}$ 1641 pc/h (Equation 25-15 or 25-16)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☒ Yes ☒ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☒ Yes ☒ No
If Yes, $V_{12a}$ = pc/h (Equation 25-18)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_F$ | 6732 | Exhibit 25-14 | 9600 | No |
| $V_{FO} = V_F - V_R$ | 5819 | Exhibit 25-14 | 9600 | No |
| $V_R$ | 913 | Exhibit 25-3 | 2000 | No |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{12}$ | 3450 | Exhibit 25-14 | 4400:All | No |

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

$D_R$ = 24.5 (pc/mi/ln)
LOS = C (Exhibit 25-4)

### Speed Determination

$D_s$ = 0.510 (Exhibit 25-19)
$S_R$ = 55.7 mph (Exhibit 25-19)
74.3 mph (Exhibit 25-19)

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

| | |
|---|---|
| Analyst | KNM |
| Agency or Company | HNTB |
| Date Performed | 03/24/08 |
| Analysis Time Period | No Build |

## Site Information

| | |
|---|---|
| Freeway/Dir of Travel | I-4 EB |
| Junction | On Ramp from US 1792 |
| Jurisdiction | Seminole County |
| Analysis Year | 2022 |

Project Description: Wekiva Parkway Project Development & Environment Study

## Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☑ Off
$L_{up}$ = 1948 ft
$V_u$ = 830 veh/h

Terrain: Level

$S_{FF}$ = 70.0 mph $S_{FR}$ = 35.0 mph

Sketch ( show lanes, $L_A$, $L_D$, $V_R$, $V_f$)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
$L_{down}$ = ft
$V_D$ = veh/h

## Conversion to pc/h Under Base Conditions

| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | $f_{HV}$ | $f_p$ | $v = V/PHF \times f_{HV} \times f_p$ |
|---|---|---|---|---|---|---|---|---|
| Freeway | 5290 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 5819 |
| Ramp | 360 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 396 |
| UpStream | 830 | 0.95 | Level | 9 | 0 | 0.957 | 1.00 | 913 |
| DownStream | | | | | | | | |

## Merge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$

$L_{EQ}$ = 980.21 (Equation 25-2 or 25-3)
$P_{FM}$ = 0.591 using Equation (Exhibit 25-5)
$V_{12}$ = 3442 pc/h
$V_3$ or $V_{av34}$ 2377 pc/h (Equation 25-4 or 25-5)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☑ Yes ☑ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☑ Yes ☑ No
If Yes, $V_{12a}$ = pc/h (Equation 25-8)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_{FO}$ | 6215 | Exhibit 25-7 | | No |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{R12}$ | 3838 | Exhibit 25-7 | 4600:All | No |

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

$D_R$ = 32.1 (pc/mi/ln)
LOS = D (Exhibit 25-4)

### Speed Determination

$M_S$ = 0.467 (Exibit 25-19)
$S_R$ = 56.9 mph (Exhibit 25-19)

## Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ}$ = (Equation 25-8 or 25-9)
$P_{FD}$ = using Equation (Exhibit 25-12)
$V_{12}$ = pc/h
$V_3$ or $V_{av34}$ pc/h (Equation 25-15 or 25-16)
Is $V_3$ or $V_{av34}$ > 2,700 pc/h? ☐ Yes ☐ No
Is $V_3$ or $V_{av34}$ > 1.5 * $V_{12}$/2 ☐ Yes ☐ No
If Yes, $V_{12a}$ = pc/h (Equation 25-18)

### Capacity Checks

| | Actual | Capacity | | LOS F? |
|---|---|---|---|---|
| $V_F$ | | Exhibit 25-14 | | |
| $V_{FO} = V_F - V_R$ | | Exhibit 25-14 | | |
| $V_R$ | | Exhibit 25-3 | | |

### Flow Entering Merge Influence Area

| | Actual | Max Desirable | | Violation? |
|---|---|---|---|---|
| $V_{12}$ | | Exhibit 25-14 | | |

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

$D_R$ = (pc/mi/ln)
LOS = (Exhibit 25-4)

### Speed Determination

$D_s$ = (Exhibit 25-19)
$S_R$ = mph (Exhibit 25-19)

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *US 441 at CR 437* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *9/14/07* | Jurisdiction | *Orange County* |
| Time Period | *No Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | *2* | | | *2* | *0* | | | | *0* | | *0* |
| Lane Group | *L* | *T* | | | *TR* | | | | | | *LR* | |
| Volume (vph) | *295* | *1445* | | | *1630* | *460* | | | | *356* | | *48* |
| % Heavy Vehicles | *11* | *11* | | | *11* | *11* | | | | *2* | | *2* |
| PHF | *0.95* | *0.95* | | | *0.95* | *0.95* | | | | *0.95* | | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | | | *A* | *A* | | | | *A* | | *A* |
| Startup Lost Time | *2.0* | *2.0* | | | *2.0* | | | | | | *2.0* | |
| Extension of Effective Green | *2.0* | *2.0* | | | *2.0* | | | | | | *2.0* | |
| Arrival Type | *3* | *3* | | | *3* | | | | | | *3* | |
| Unit Extension | *3.0* | *3.0* | | | *3.0* | | | | | | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | | *0* | *0* | *0* | | | | *0* | *0* | *0* |
| Lane Width | *12.0* | *12.0* | | | *12.0* | | | | | | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | | | | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | *0* | | | *0* | | | | | | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | | | | *3.2* | |

| Phasing | EB Only | EW Perm | 03 | 04 | SB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *15.0* | G = *80.0* | G = | G = | G = *35.0* | G = | G = | G = |
| | Y = *5* | Y = *5* | Y = | Y = | Y = *5* | Y = | Y = | Y = |

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *145.0*

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *311* | *1521* | | | *2200* | | | | | | *426* | |
| Lane Group Capacity | *218* | *2248* | | | *1739* | | | | | | *424* | |
| v/c Ratio | *1.43* | *0.68* | | | *1.27* | | | | | | *1.00* | |
| Green Ratio | *0.69* | *0.69* | | | *0.55* | | | | | | *0.24* | |
| Uniform Delay $d_1$ | *53.2* | *13.1* | | | *32.5* | | | | | | *55.0* | |
| Delay Factor k | *0.50* | *0.25* | | | *0.50* | | | | | | *0.50* | |
| Incremental Delay $d_2$ | *216.5* | *0.8* | | | *124.0* | | | | | | *44.9* | |
| PF Factor | *1.000* | *1.000* | | | *1.000* | | | | | | *1.000* | |
| Control Delay | *269.7* | *13.9* | | | *156.5* | | | | | | *99.9* | |
| Lane Group LOS | *F* | *B* | | | *F* | | | | | | *F* | |
| Approach Delay | *57.3* | | | *156.5* | | | | | | *99.9* | | |
| Approach LOS | *E* | | | *F* | | | | | | *F* | | |
| Intersection Delay | *110.4* | | | Intersection LOS | | | | | | *F* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | KNM | Intersection | US 441 West of WP Interchange |
| Agency or Co. | HNTB | Area Type | All other areas |
| Date Performed | 09/28/07 | Jurisdiction | Orange County |
| Time Period | Build I-4 Connection @ SR417 | Analysis Year | 2022 No Build |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | | 2 | | | 2 | 1 | | | | 1 | | 2 |
| Lane Group | | T | | | T | R | | | | L | | R |
| Volume (vph) | | 1138 | | | 1995 | 105 | | | | 195 | | 1956 |
| % Heavy Vehicles | | 10 | | | 10 | 10 | | | | 2 | | 2 |
| PHF | | 0.95 | | | 0.95 | 0.95 | | | | 0.95 | | 0.95 |
| Pretimed/Actuated (P/A) | | A | | | A | A | | | | A | | A |
| Startup Lost Time | | 2.0 | | | 2.0 | 2.0 | | | | 2.0 | | 2.0 |
| Extension of Effective Green | | 2.0 | | | 2.0 | 2.0 | | | | 2.0 | | 2.0 |
| Arrival Type | | 3 | | | 3 | 3 | | | | 3 | | 3 |
| Unit Extension | | 3.0 | | | 3.0 | 3.0 | | | | 3.0 | | 3.0 |
| Ped/Bike/RTOR Volume | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Lane Width | | 12.0 | | | 12.0 | 12.0 | | | | 12.0 | | 12.0 |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | 0 | | | 0 | 0 | | | | 0 | | 0 |
| Minimum Pedestrian Time | | 3.2 | | | 3.2 | | | 3.2 | | | 3.2 | |

| Phasing | Thru & RT | 02 | 03 | 04 | SB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 35.0 | G = | G = | G = | G = 25.0 | G = | G = | G = |
| | Y = 5 | Y = | Y = | Y = | Y = 5 | Y = | Y = | Y = |
| Duration of Analysis (hrs) = 0.25 | | | | | | Cycle Length C = 70.0 | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | 1198 | | | 2100 | 111 | | | | 205 | | 2059 |
| Lane Group Capacity | | 1645 | | | 1645 | 1468 | | | | 632 | | 2803 |
| v/c Ratio | | 0.73 | | | 1.28 | 0.08 | | | | 0.32 | | 0.73 |
| Green Ratio | | 0.50 | | | 0.50 | 1.00 | | | | 0.36 | | 1.00 |
| Uniform Delay $d_1$ | | 13.8 | | | 17.5 | 0.0 | | | | 16.4 | | 0.0 |
| Delay Factor k | | 0.29 | | | 0.50 | 0.11 | | | | 0.11 | | 0.29 |
| Incremental Delay $d_2$ | | 1.7 | | | 129.3 | 0.0 | | | | 0.3 | | 1.0 |
| PF Factor | | 1.000 | | | 1.000 | 0.950 | | | | 1.000 | | 0.950 |
| Control Delay | | 15.4 | | | 146.8 | 0.0 | | | | 16.7 | | 1.0 |
| Lane Group LOS | | B | | | F | A | | | | B | | A |
| Approach Delay | | 15.4 | | | 139.5 | | | | | 2.4 | | |
| Approach LOS | | B | | | F | | | | | A | | |
| Intersection Delay | | 58.6 | | | Intersection LOS | | | | | E | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | KNM | Intersection | US 441 at Wekiva Parkway |
| Agency or Co. | HNTB | Area Type | All other areas |
| Date Performed | 9/14/07 | Jurisdiction | Orange County |
| Time Period | Build I-4 Connection @ SR 417 | Analysis Year | 2022 No Build |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | | 1 | 2 | 2 | 1 | | 2 | | 1 | | | |
| Lane Group | | T | R | L | T | | L | | R | | | |
| Volume (vph) | | 150 | 2131 | 789 | 58 | | 1898 | | 1022 | | | |
| % Heavy Vehicles | | 2 | 2 | 2 | 2 | | 10 | | 10 | | | |
| PHF | | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | | 0.95 | | | |
| Pretimed/Actuated (P/A) | | A | A | A | A | | A | | A | | | |
| Startup Lost Time | | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | | 2.0 | | | |
| Extension of Effective Green | | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | | 2.0 | | | |
| Arrival Type | | 3 | 3 | 3 | 3 | | 3 | | 3 | | | |
| Unit Extension | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | | 3.0 | | | |
| Ped/Bike/RTOR Volume | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | |
| Lane Width | | 12.0 | 12.0 | 12.0 | 12.0 | | 12.0 | | 12.0 | | | |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | 0 | 0 | 0 | 0 | | 0 | | 0 | | | |
| Minimum Pedestrian Time | | 3.2 | | | 3.2 | | | 3.2 | | | 3.2 | |

| Phasing | WB Only | EW Perm | 03 | 04 | NB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 35.0 | G = 20.0 | G = | G = | G = 50.0 | G = | G = | G = |
| | Y = 5 | Y = 5 | Y = | Y = | Y = 5 | Y = | Y = | Y = |

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 120.0

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | 158 | 2243 | 831 | 61 | | 1998 | | 1076 | | | |
| Lane Group Capacity | | 311 | 1752 | 1228 | 311 | | 1328 | | 1101 | | | |
| v/c Ratio | | 0.51 | 1.28 | 0.68 | 0.20 | | 1.50 | | 0.98 | | | |
| Green Ratio | | 0.17 | 0.63 | 0.50 | 0.17 | | 0.42 | | 0.75 | | | |
| Uniform Delay $d_1$ | | 45.5 | 22.5 | 20.5 | 43.1 | | 35.0 | | 14.0 | | | |
| Delay Factor k | | 0.12 | 0.50 | 0.25 | 0.11 | | 0.50 | | 0.48 | | | |
| Incremental Delay $d_2$ | | 1.4 | 130.6 | 1.5 | 0.3 | | 231.0 | | 21.7 | | | |
| PF Factor | | 1.000 | 1.000 | 1.000 | 1.000 | | 1.000 | | 1.000 | | | |
| Control Delay | | 46.9 | 153.1 | 22.0 | 43.4 | | 266.0 | | 35.8 | | | |
| Lane Group LOS | | D | F | C | D | | F | | D | | | |
| Approach Delay | | 146.2 | | | 23.5 | | | 185.4 | | | | |
| Approach LOS | | F | | | C | | | F | | | | |
| Intersection Delay | | 147.9 | | | Intersection LOS | | | | | | F | |



HCS+™ Version 5.4 Generated: 8/27/2010 3:40 PM

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *CR 437 East of WP Interchange* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *9/14/07* | Jurisdiction | *Orange County* |
| Time Period | *Build I-4 Connection @ SR417* | Analysis Year | *2022 No Build* |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | | *1* | | | | *1* | *2* | | | *2* | *1* |
| Lane Group | *L* | | *R* | | | | *L* | *T* | | | *T* | *R* |
| Volume (vph) | *1113* | | *59* | | | | *42* | *811* | | | *345* | *805* |
| % Heavy Vehicles | *2* | | *2* | | | | *2* | *2* | | | *2* | *2* |
| PHF | *0.95* | | *0.95* | | | | *0.95* | *0.95* | | | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | | *A* | | | | *A* | *A* | | | *A* | *A* |
| Startup Lost Time | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Extension of Effective Green | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Arrival Type | *3* | | *3* | | | | *3* | *3* | | | *3* | *3* |
| Unit Extension | *3.0* | | *3.0* | | | | *3.0* | *3.0* | | | *3.0* | *3.0* |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | | | | *0* | *0* | | *0* | *0* | *0* |
| Lane Width | *12.0* | | *12.0* | | | | *12.0* | *12.0* | | | *12.0* | *12.0* |
| Parking/Grade/Parking | *N* | *0* | *N* | | | | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | | *0* | | | | *0* | *0* | | | *0* | *0* |
| Minimum Pedestrian Time | | *3.2* | | | | | | *3.2* | | | *3.2* | |

| Phasing | EB Only | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *20.0* | G = | G = | G = | G = *30.0* | G = | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | | Cycle Length C = *60.0* | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *1172* | | *62* | | | | *44* | *854* | | | *363* | *847* |
| Lane Group Capacity | *590* | | *1583* | | | | *499* | *1774* | | | *1774* | *1583* |
| v/c Ratio | *1.99* | | *0.04* | | | | *0.09* | *0.48* | | | *0.20* | *0.54* |
| Green Ratio | *0.33* | | *1.00* | | | | *0.50* | *0.50* | | | *0.50* | *1.00* |
| Uniform Delay $d_1$ | *20.0* | | *0.0* | | | | *7.8* | *9.9* | | | *8.4* | *0.0* |
| Delay Factor k | *0.50* | | *0.11* | | | | *0.11* | *0.11* | | | *0.11* | *0.14* |
| Incremental Delay $d_2$ | *450.0* | | *0.0* | | | | *0.1* | *0.2* | | | *0.1* | *0.4* |
| PF Factor | *1.000* | | *0.950* | | | | *1.000* | *1.000* | | | *1.000* | *0.950* |
| Control Delay | *470.0* | | *0.0* | | | | *7.9* | *10.1* | | | *8.4* | *0.4* |
| Lane Group LOS | *F* | | *A* | | | | *A* | *B* | | | *A* | *A* |
| Approach Delay | *446.3* | | | | | | *10.0* | | | *2.8* | | |
| Approach LOS | *F* | | | | | | *A* | | | *A* | | |
| Intersection Delay | *168.5* | | | Intersection LOS | | | | | | *F* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *CR 437 at Ponkan Road* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *1/16/07* | Jurisdiction | *Orange County* |
| Time Period | *No Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *2* | *1* | *1* | *1* | *1* |
| Lane Group | | *LTR* | | | *LTR* | | *L* | *T* | *R* | *L* | *T* | *R* |
| Volume (vph) | *64* | *204* | *102* | *49* | *276* | *125* | *115* | *1391* | *44* | *75* | *432* | *43* |
| % Heavy Vehicles | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | | *2.0* | | | *2.0* | | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* |
| Extension of Effective Green | | *2.0* | | | *2.0* | | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* |
| Arrival Type | | *3* | | | *3* | | *3* | *3* | *3* | *3* | *3* | *3* |
| Unit Extension | | *3.0* | | | *3.0* | | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | | *12.0* | | | *12.0* | | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | *0* | | | *0* | | *0* | *0* | *0* | *0* | *0* | *0* |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | EW Perm | 02 | 03 | 04 | Excl. Left | Thru & RT | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *55.0* | G = | G = | G = | G = *15.0* | G = *75.0* | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = *5* | Y = | Y = |

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *160.0*

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | *389* | | | *475* | | *121* | *1464* | *46* | *79* | *455* | *45* |
| Lane Group Capacity | | *439* | | | *534* | | *166* | *1663* | *742* | *166* | *873* | *742* |
| v/c Ratio | | *0.89* | | | *0.89* | | *0.73* | *0.88* | *0.06* | *0.48* | *0.52* | *0.06* |
| Green Ratio | | *0.34* | | | *0.34* | | *0.09* | *0.47* | *0.47* | *0.09* | *0.47* | *0.47* |
| Uniform Delay $d_1$ | | *49.5* | | | *49.6* | | *70.5* | *38.4* | *23.3* | *68.8* | *29.9* | *23.2* |
| Delay Factor k | | *0.41* | | | *0.41* | | *0.29* | *0.41* | *0.11* | *0.11* | *0.13* | *0.11* |
| Incremental Delay $d_2$ | | *19.1* | | | *16.8* | | *15.0* | *5.8* | *0.0* | *2.1* | *0.6* | *0.0* |
| PF Factor | | *1.000* | | | *1.000* | | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* |
| Control Delay | | *68.7* | | | *66.4* | | *85.5* | *44.3* | *23.3* | *70.9* | *30.4* | *23.3* |
| Lane Group LOS | | *E* | | | *E* | | *F* | *D* | *C* | *E* | *C* | *C* |
| Approach Delay | *68.7* | | | *66.4* | | | *46.7* | | | *35.4* | | |
| Approach LOS | *E* | | | *E* | | | *D* | | | *D* | | |
| Intersection Delay | *50.4* | | | Intersection LOS | | | | | | *D* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *CR 437 at Kelly Park Road* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *1/25/2007* | Jurisdiction | *Orange County* |
| Time Period | *No Build SR46 2-Lane Arterial* | Analysis Year | *2022* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *0* | *1* | *0* | *0* | *1* | *0* | *0* | *1* | *0* | *0* | *1* | *0* |
| Lane Group | | *LTR* | | | *LTR* | | | *LTR* | | | *LTR* | |
| Volume (vph) | *90* | *207* | *63* | *119* | *159* | *162* | *51* | *690* | *109* | *130* | *428* | *32* |
| % Heavy Vehicles | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | | *2.0* | | | *2.0* | | | *2.0* | | | *2.0* | |
| Extension of Effective Green | | *2.0* | | | *2.0* | | | *2.0* | | | *2.0* | |
| Arrival Type | | *3* | | | *3* | | | *3* | | | *3* | |
| Unit Extension | | *3.0* | | | *3.0* | | | *3.0* | | | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | | *12.0* | | | *12.0* | | | *12.0* | | | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | *0* | | | *0* | | | *0* | | | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | EW Perm | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *30.0* | G = | G = | G = | G = *50.0* | G = | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | | Cycle Length C = *90.0* | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | *379* | | | *463* | | | *895* | | | *622* | |
| Lane Group Capacity | | *436* | | | *419* | | | *951* | | | *639* | |
| v/c Ratio | | *0.87* | | | *1.11* | | | *0.94* | | | *0.97* | |
| Green Ratio | | *0.33* | | | *0.33* | | | *0.56* | | | *0.56* | |
| Uniform Delay $d_1$ | | *28.2* | | | *30.0* | | | *18.6* | | | *19.4* | |
| Delay Factor k | | *0.40* | | | *0.50* | | | *0.45* | | | *0.48* | |
| Incremental Delay $d_2$ | | *17.0* | | | *75.5* | | | *16.8* | | | *28.9* | |
| PF Factor | | *1.000* | | | *1.000* | | | *1.000* | | | *1.000* | |
| Control Delay | | *45.1* | | | *105.5* | | | *35.4* | | | *48.3* | |
| Lane Group LOS | | *D* | | | *F* | | | *D* | | | *D* | |
| Approach Delay | *45.1* | | | *105.5* | | | *35.4* | | | *48.3* | | |
| Approach LOS | *D* | | | *F* | | | *D* | | | *D* | | |
| Intersection Delay | *54.1* | | | Intersection LOS | | | | | | *D* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | KNM | Intersection | SR 46 and US 441 SB Ramps |
| Agency or Co. | HNTB | Area Type | All other areas |
| Date Performed | 1/25/2007 | Jurisdiction | Lake County |
| Time Period | No Build SR46 2-Lane Arterial | Analysis Year | 2022 No Build |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | | 1 | 1 | 1 | 1 | | | | | 1 | | 1 |
| Lane Group | | T | R | L | T | | | | | L | | R |
| Volume (vph) | | 449 | 55 | 114 | 679 | | | | | 333 | | 169 |
| % Heavy Vehicles | | 11 | 11 | 11 | 11 | | | | | 10 | | 10 |
| PHF | | 0.95 | 0.95 | 0.95 | 0.95 | | | | | 0.95 | | 0.95 |
| Pretimed/Actuated (P/A) | | A | A | A | A | | | | | A | | A |
| Startup Lost Time | | 2.0 | 2.0 | 2.0 | 2.0 | | | | | 2.0 | | 2.0 |
| Extension of Effective Green | | 2.0 | 2.0 | 2.0 | 2.0 | | | | | 2.0 | | 2.0 |
| Arrival Type | | 3 | 3 | 3 | 3 | | | | | 3 | | 3 |
| Unit Extension | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | | 3.0 |
| Ped/Bike/RTOR Volume | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Lane Width | | 12.0 | 12.0 | 12.0 | 12.0 | | | | | 12.0 | | 12.0 |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | 0 | 0 | 0 | 0 | | | | | 0 | | 0 |
| Minimum Pedestrian Time | | 3.2 | | | 3.2 | | | 3.2 | | | 3.2 | |

| Phasing | WB Only | EW Perm | 03 | 04 | SB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 15.0 | G = 50.0 | G = | G = | G = 30.0 | G = | G = | G = |
| | Y = 5 | Y = 5 | Y = | Y = | Y = 5 | Y = | Y = | Y = |
| Duration of Analysis (hrs) = 0.25 | | | | | | Cycle Length C = 110.0 | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | 473 | 58 | 120 | 715 | | | | | 351 | | 178 |
| Lane Group Capacity | | 778 | 1124 | 480 | 1089 | | | | | 448 | | 1468 |
| v/c Ratio | | 0.61 | 0.05 | 0.25 | 0.66 | | | | | 0.78 | | 0.12 |
| Green Ratio | | 0.45 | 0.77 | 0.64 | 0.64 | | | | | 0.27 | | 1.00 |
| Uniform Delay $d_1$ | | 22.6 | 3.0 | 10.3 | 12.5 | | | | | 37.0 | | 0.0 |
| Delay Factor k | | 0.19 | 0.11 | 0.11 | 0.23 | | | | | 0.33 | | 0.11 |
| Incremental Delay $d_2$ | | 1.4 | 0.0 | 0.3 | 1.5 | | | | | 8.8 | | 0.0 |
| PF Factor | | 1.000 | 1.000 | 1.000 | 1.000 | | | | | 1.000 | | 0.950 |
| Control Delay | | 24.0 | 3.0 | 10.6 | 13.9 | | | | | 45.8 | | 0.0 |
| Lane Group LOS | | C | A | B | B | | | | | D | | A |
| Approach Delay | | 21.7 | | | 13.5 | | | | | 30.4 | | |
| Approach LOS | | C | | | B | | | | | C | | |
| Intersection Delay | | 20.5 | | | Intersection LOS | | | | | C | | |



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# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | KNM | Intersection | SR 46 and US 441 NB Ramps |
| Agency or Co. | HNTB | Area Type | All other areas |
| Date Performed | 1/25/2007 | Jurisdiction | Lake County |
| Time Period | No Build SR46 2-Lane Arterial | Analysis Year | 2022 No Build |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | 1 | 1 | | | 1 | 1 | 1 | | 1 | | | |
| Lane Group | L | T | | | T | R | L | | R | | | |
| Volume (vph) | 99 | 683 | | | 604 | 377 | 189 | | 152 | | | |
| % Heavy Vehicles | 11 | 11 | | | 11 | 11 | 10 | | 10 | | | |
| PHF | 0.95 | 0.95 | | | 0.95 | 0.95 | 0.95 | | 0.95 | | | |
| Pretimed/Actuated (P/A) | A | A | | | A | A | A | | A | | | |
| Startup Lost Time | 2.0 | 2.0 | | | 2.0 | 2.0 | 2.0 | | 2.0 | | | |
| Extension of Effective Green | 2.0 | 2.0 | | | 2.0 | 2.0 | 2.0 | | 2.0 | | | |
| Arrival Type | 3 | 3 | | | 3 | 3 | 3 | | 3 | | | |
| Unit Extension | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | | | |
| Ped/Bike/RTOR Volume | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Lane Width | 12.0 | 12.0 | | | 12.0 | 12.0 | 12.0 | | 12.0 | | | |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | 0 | 0 | | | 0 | 0 | 0 | | 0 | | | |
| Minimum Pedestrian Time | | 3.2 | | | 3.2 | | | 3.2 | | | 3.2 | |

| Phasing | EB Only | EW Perm | 03 | 04 | NB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 15.0 | G = 60.0 | G = | G = | G = 20.0 | G = | G = | G = |
| | Y = 5 | Y = 5 | Y = | Y = | Y = 5 | Y = | Y = | Y = |
| Duration of Analysis (hrs) = 0.25 | | | | | | Cycle Length C = 110.0 | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | 104 | 719 | | | 636 | 397 | 199 | | 160 | | | |
| Lane Group Capacity | 470 | 1245 | | | 934 | 1124 | 298 | | 1468 | | | |
| v/c Ratio | 0.22 | 0.58 | | | 0.68 | 0.35 | 0.67 | | 0.11 | | | |
| Green Ratio | 0.73 | 0.73 | | | 0.55 | 0.77 | 0.18 | | 1.00 | | | |
| Uniform Delay $d_1$ | 8.3 | 7.1 | | | 18.1 | 3.9 | 41.9 | | 0.0 | | | |
| Delay Factor k | 0.11 | 0.17 | | | 0.25 | 0.11 | 0.24 | | 0.11 | | | |
| Incremental Delay $d_2$ | 0.2 | 0.7 | | | 2.0 | 0.2 | 5.6 | | 0.0 | | | |
| PF Factor | 1.000 | 1.000 | | | 1.000 | 1.000 | 1.000 | | 0.950 | | | |
| Control Delay | 8.6 | 7.7 | | | 20.1 | 4.1 | 47.5 | | 0.0 | | | |
| Lane Group LOS | A | A | | | C | A | D | | A | | | |
| Approach Delay | 7.8 | | | 14.0 | | | 26.4 | | | | | |
| Approach LOS | A | | | B | | | C | | | | | |
| Intersection Delay | 13.7 | | | Intersection LOS | | | B | | | | | |



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# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *SR 46 at CR 435* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *1/25/2007* | Jurisdiction | *Lake County* |
| Time Period | *No-Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | *1* | *0* | *1* | *1* | *0* | *0* | *1* | *1* | *1* | *1* | *0* |
| Lane Group | *L* | *TR* | | *L* | *TR* | | | *LT* | *R* | *L* | *TR* | |
| Volume (vph) | *4* | *670* | *246* | *357* | *674* | *19* | *301* | *15* | *224* | *9* | *16* | *6* |
| % Heavy Vehicles | *11* | *11* | *11* | *11* | *11* | *11* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | *2.0* | *2.0* | | *2.0* | *2.0* | | | *2.0* | *2.0* | *2.0* | *2.0* | |
| Extension of Effective Green | *2.0* | *2.0* | | *2.0* | *2.0* | | | *2.0* | *2.0* | *2.0* | *2.0* | |
| Arrival Type | *3* | *3* | | *3* | *3* | | | *3* | *3* | *3* | *3* | |
| Unit Extension | *3.0* | *3.0* | | *3.0* | *3.0* | | | *3.0* | *3.0* | *3.0* | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | *12.0* | *12.0* | | *12.0* | *12.0* | | | *12.0* | *12.0* | *12.0* | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | *0* | | *0* | *0* | | | *0* | *0* | *0* | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | WB Only | EW Perm | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *20.0* | G = *68.0* | G = | G = | G = *25.0* | G = | G = | G = |
| | Y = *5.5* | Y = *5.5* | Y = | Y = | Y = *6.5* | Y = | Y = | Y = |

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *130.5*

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *4* | *964* | | *376* | *729* | | | *333* | *236* | *9* | *23* | |
| Lane Group Capacity | *347* | *856* | | *304* | *1222* | | | *257* | *625* | *60* | *343* | |
| v/c Ratio | *0.01* | *1.13* | | *1.24* | *0.60* | | | *1.30* | *0.38* | *0.15* | *0.07* | |
| Green Ratio | *0.52* | *0.52* | | *0.72* | *0.72* | | | *0.19* | *0.39* | *0.19* | *0.19* | |
| Uniform Delay $d_1$ | *15.1* | *31.3* | | *30.7* | *9.2* | | | *52.8* | *28.1* | *43.9* | *43.2* | |
| Delay Factor k | *0.11* | *0.50* | | *0.50* | *0.19* | | | *0.50* | *0.11* | *0.11* | *0.11* | |
| Incremental Delay $d_2$ | *0.0* | *71.6* | | *131.6* | *0.8* | | | *158.8* | *0.4* | *1.2* | *0.1* | |
| PF Factor | *1.000* | *1.000* | | *1.000* | *1.000* | | | *1.000* | *1.000* | *1.000* | *1.000* | |
| Control Delay | *15.1* | *102.9* | | *162.3* | *10.0* | | | *211.5* | *28.5* | *45.1* | *43.3* | |
| Lane Group LOS | *B* | *F* | | *F* | *A* | | | *F* | *C* | *D* | *D* | |
| Approach Delay | *102.5* | | | *61.8* | | | *135.6* | | | *43.8* | | |
| Approach LOS | *F* | | | *E* | | | *F* | | | *D* | | |
| Intersection Delay | *92.0* | | | Intersection LOS | | | | | | *F* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *SR 46 at Round Lake Road* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *1/25/2007* | Jurisdiction | *Lake County* |
| Time Period | *No-Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | *1* | *0* | *1* | *1* | *1* | *0* | *1* | *0* | *0* | *1* | *0* |
| Lane Group | *L* | *TR* | | *L* | *T* | *R* | | *LTR* | | | *LTR* | |
| Volume (vph) | *28* | *595* | *57* | *74* | *627* | *49* | *146* | *181* | *253* | *104* | *255* | *111* |
| % Heavy Vehicles | *11* | *11* | *11* | *11* | *11* | *11* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | *2.0* | *2.0* | | *2.0* | *2.0* | *2.0* | | *2.0* | | | *2.0* | |
| Extension of Effective Green | *2.0* | *2.0* | | *2.0* | *2.0* | *2.0* | | *2.0* | | | *2.0* | |
| Arrival Type | *3* | *3* | | *3* | *3* | *3* | | *3* | | | *3* | |
| Unit Extension | *3.0* | *3.0* | | *3.0* | *3.0* | *3.0* | | *3.0* | | | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | *12.0* | *12.0* | | *12.0* | *12.0* | *12.0* | | *12.0* | | | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | *0* | | *0* | *0* | *0* | | *0* | | | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | EW Perm | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *45.0* | G = | G = | G = | G = *45.0* | G = | G = | G = |
| | Y = *7* | Y = | Y = | Y = | Y = *6* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | Cycle Length C = *103.0* | | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *29* | *686* | | *78* | *660* | *52* | | *611* | | | *494* | |
| Lane Group Capacity | *127* | *738* | | *109* | *748* | *636* | | *538* | | | *564* | |
| v/c Ratio | *0.23* | *0.93* | | *0.72* | *0.88* | *0.08* | | *1.14* | | | *0.88* | |
| Green Ratio | *0.44* | *0.44* | | *0.44* | *0.44* | *0.44* | | *0.44* | | | *0.44* | |
| Uniform Delay $d_1$ | *18.1* | *27.5* | | *23.8* | *26.6* | *16.9* | | *29.0* | | | *26.5* | |
| Delay Factor k | *0.11* | *0.45* | | *0.28* | *0.41* | *0.11* | | *0.50* | | | *0.40* | |
| Incremental Delay $d_2$ | *0.9* | *18.2* | | *20.0* | *12.0* | *0.1* | | *81.9* | | | *14.4* | |
| PF Factor | *1.000* | *1.000* | | *1.000* | *1.000* | *1.000* | | *1.000* | | | *1.000* | |
| Control Delay | *19.1* | *45.7* | | *43.8* | *38.6* | *17.0* | | *110.9* | | | *40.9* | |
| Lane Group LOS | *B* | *D* | | *D* | *D* | *B* | | *F* | | | *D* | |
| Approach Delay | *44.6* | | | *37.7* | | | *110.9* | | | *40.9* | | |
| Approach LOS | *D* | | | *D* | | | *F* | | | *D* | | |
| Intersection Delay | *57.3* | | | Intersection LOS | | | | | | *E* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *SR 46 at CR 437* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *1/25/2007* | Jurisdiction | *Lake County* |
| Time Period | *No-Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* |
| Lane Group | *L* | *T* | *R* | *L* | *T* | *R* | *L* | *T* | *R* | *L* | *T* | *R* |
| Volume (vph) | *180* | *328* | *112* | *207* | *454* | *449* | *205* | *166* | *299* | *286* | *51* | *113* |
| % Heavy Vehicles | *11* | *11* | *11* | *11* | *11* | *11* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* |
| Extension of Effective Green | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* |
| Arrival Type | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* |
| Unit Extension | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | Excl. Left | Thru & RT | 03 | 04 | Excl. Left | Thru & RT | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *15.0* | G = *40.0* | G = | G = | G = *15.0* | G = *15.0* | G = | G = |
| | Y = *5* | Y = *5* | Y = | Y = | Y = *5* | Y = *5* | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | | Cycle Length C = *105.0* | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *189* | *345* | *118* | *218* | *478* | *473* | *216* | *175* | *315* | *301* | *54* | *119* |
| Lane Group Capacity | *232* | *652* | *831* | *232* | *652* | *554* | *253* | *266* | *528* | *253* | *266* | *528* |
| v/c Ratio | *0.81* | *0.53* | *0.14* | *0.94* | *0.73* | *0.85* | *0.85* | *0.66* | *0.60* | *1.19* | *0.20* | *0.23* |
| Green Ratio | *0.14* | *0.38* | *0.57* | *0.14* | *0.38* | *0.38* | *0.14* | *0.14* | *0.33* | *0.14* | *0.14* | *0.33* |
| Uniform Delay $d_1$ | *43.7* | *25.2* | *10.5* | *44.6* | *27.9* | *29.8* | *43.9* | *42.6* | *29.1* | *45.0* | *39.7* | *25.2* |
| Delay Factor k | *0.36* | *0.13* | *0.11* | *0.45* | *0.29* | *0.39* | *0.39* | *0.23* | *0.19* | *0.50* | *0.11* | *0.11* |
| Incremental Delay $d_2$ | *19.6* | *0.8* | *0.1* | *42.6* | *4.3* | *12.3* | *23.6* | *5.8* | *1.8* | *117.7* | *0.4* | *0.2* |
| PF Factor | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* |
| Control Delay | *63.3* | *26.0* | *10.6* | *87.2* | *32.2* | *42.2* | *67.5* | *48.4* | *31.0* | *162.7* | *40.1* | *25.4* |
| Lane Group LOS | *E* | *C* | *B* | *F* | *C* | *D* | *E* | *D* | *C* | *F* | *D* | *C* |
| Approach Delay | *34.0* | | | *46.5* | | | *46.5* | | | *114.3* | | |
| Approach LOS | *C* | | | *D* | | | *D* | | | *F* | | |
| Intersection Delay | *54.5* | | | Intersection LOS | | | | | | *D* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *SR 46 at CR 46A* |
| Agency or Co. | *HNTB* | Area Type | *All other areas* |
| Date Performed | *01/25/2007* | Jurisdiction | *Lake County* |
| Time Period | *No Build SR46 2-Lane Arterial* | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *0* | *1* | | | *1* | *1* | | | | *0* | | *0* |
| Lane Group | | *LT* | | | *T* | *R* | | | | | *LR* | |
| Volume (vph) | *5* | *855* | | | *974* | *686* | | | | *442* | | *18* |
| % Heavy Vehicles | *11* | *11* | | | *11* | *11* | | | | *2* | | *2* |
| PHF | *0.95* | *0.95* | | | *0.95* | *0.95* | | | | *0.95* | | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | | | *A* | *A* | | | | *A* | | *A* |
| Startup Lost Time | | *2.0* | | | *2.0* | *2.0* | | | | | *2.0* | |
| Extension of Effective Green | | *2.0* | | | *2.0* | *2.0* | | | | | *2.0* | |
| Arrival Type | | *3* | | | *3* | *3* | | | | | *3* | |
| Unit Extension | | *3.0* | | | *3.0* | *3.0* | | | | | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | | *0* | *0* | *0* | | | | *0* | *0* | *0* |
| Lane Width | | *12.0* | | | *12.0* | *12.0* | | | | | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | | | | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | | *0* | | | *0* | *0* | | | | | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | | | | *3.2* | |

| Phasing | EW Perm | 02 | 03 | 04 | SB Only | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *85.0* | G = | G = | G = | G = *35.0* | G = | G = | G = |
| | Y = *7* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | | Cycle Length C = *132.0* | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | | *905* | | | *1025* | *722* | | | | | *484* | |
| Lane Group Capacity | | *1097* | | | *1102* | *1455* | | | | | *469* | |
| v/c Ratio | | *0.82* | | | *0.93* | *0.50* | | | | | *1.03* | |
| Green Ratio | | *0.64* | | | *0.64* | *1.00* | | | | | *0.27* | |
| Uniform Delay $d_1$ | | *17.8* | | | *20.9* | *0.0* | | | | | *48.5* | |
| Delay Factor k | | *0.36* | | | *0.45* | *0.11* | | | | | *0.50* | |
| Incremental Delay $d_2$ | | *5.3* | | | *13.5* | *0.3* | | | | | *50.0* | |
| PF Factor | | *1.000* | | | *1.000* | *0.950* | | | | | *1.000* | |
| Control Delay | | *23.1* | | | *34.4* | *0.3* | | | | | *98.5* | |
| Lane Group LOS | | *C* | | | *C* | *A* | | | | | *F* | |
| Approach Delay | *23.1* | | | *20.3* | | | | | | *98.5* | | |
| Approach LOS | *C* | | | *C* | | | | | | *F* | | |
| Intersection Delay | *33.2* | | | Intersection LOS | | | | | | *C* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *CTR* | Intersection | *SR 46 at Wekiva River Road* |
| Agency or Co. | *HNTB* | | |
| Date Performed | *3/14/07* | Area Type | *All other areas* |
| Time Period | *No-Build SR46 2-Lane Arterial* | Jurisdiction | *Lake County* |
| | | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | *1* | *1* | *1* | *1* | *1* | *0* | *1* | *1* | *0* | *1* | *0* |
| Lane Group | *L* | *T* | *R* | *L* | *T* | *R* | | *LT* | *R* | | *LTR* | |
| Volume (vph) | *2* | *1318* | *50* | *93* | *1565* | *2* | *24* | *0* | *66* | *1* | *0* | *1* |
| % Heavy Vehicles | *11* | *11* | *11* | *11* | *11* | *11* | *2* | *2* | *2* | *2* | *2* | *2* |
| PHF | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* | *A* |
| Startup Lost Time | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | | *2.0* | *2.0* | | *2.0* | |
| Extension of Effective Green | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | *2.0* | | *2.0* | *2.0* | | *2.0* | |
| Arrival Type | *3* | *3* | *3* | *3* | *3* | *3* | | *3* | *3* | | *3* | |
| Unit Extension | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | | *3.0* | *3.0* | | *3.0* | |
| Ped/Bike/RTOR Volume | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| Lane Width | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | *12.0* | | *12.0* | *12.0* | | *12.0* | |
| Parking/Grade/Parking | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | *0* | *0* | *0* | *0* | *0* | | *0* | *0* | | *0* | |
| Minimum Pedestrian Time | | *3.2* | | | *3.2* | | | *3.2* | | | *3.2* | |

| Phasing | EW Perm | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *125.0* | G = | G = | G = | G = *10.0* | G = | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | Cycle Length C = *145.0* | | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *2* | *1387* | *53* | *98* | *1647* | *2* | | *25* | *69* | | *2* | |
| Lane Group Capacity | *50* | *1476* | *1254* | *154* | *1476* | *1254* | | *93* | *109* | | *108* | |
| v/c Ratio | *0.04* | *0.94* | *0.04* | *0.64* | *1.12* | *0.00* | | *0.27* | *0.63* | | *0.02* | |
| Green Ratio | *0.86* | *0.86* | *0.86* | *0.86* | *0.86* | *0.86* | | *0.07* | *0.07* | | *0.07* | |
| Uniform Delay $d_1$ | *1.4* | *7.3* | *1.4* | *3.1* | *10.0* | *1.4* | | *64.0* | *65.7* | | *62.9* | |
| Delay Factor k | *0.11* | *0.45* | *0.11* | *0.22* | *0.50* | *0.11* | | *0.11* | *0.21* | | *0.11* | |
| Incremental Delay $d_2$ | *0.3* | *12.0* | *0.0* | *8.4* | *62.0* | *0.0* | | *1.6* | *11.4* | | *0.1* | |
| PF Factor | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | | *1.000* | *1.000* | | *1.000* | |
| Control Delay | *1.8* | *19.2* | *1.4* | *11.5* | *72.0* | *1.4* | | *65.6* | *77.1* | | *63.0* | |
| Lane Group LOS | *A* | *B* | *A* | *B* | *E* | *A* | | *E* | *E* | | *E* | |
| Approach Delay | *18.5* | | | *68.5* | | | *74.0* | | | *63.0* | | |
| Approach LOS | *B* | | | *E* | | | *E* | | | *E* | | |
| Intersection Delay | *46.7* | | | Intersection LOS | | | *D* | | | | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | *KNM* | Intersection | *US 17/92 and I-4 WB Ramps* |
| Agency or Co. | *HNTB* | | |
| Date Performed | *3/24/08* | Area Type | *All other areas* |
| Time Period | *Build I-4 Connection @ SR 417* | Jurisdiction | *Seminole County* |
| | | Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | | *2* | | | | *1* | *2* | | | *2* | *1* |
| Lane Group | *L* | | *R* | | | | *L* | *T* | | | *T* | *R* |
| Volume (vph) | *18* | | *342* | | | | *249* | *1955* | | | *559* | *581* |
| % Heavy Vehicles | *9* | | *9* | | | | *11* | *11* | | | *11* | *11* |
| PHF | *0.95* | | *0.95* | | | | *0.95* | *0.95* | | | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | | *A* | | | | *A* | *A* | | | *A* | *A* |
| Startup Lost Time | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Extension of Effective Green | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Arrival Type | *3* | | *3* | | | | *3* | *3* | | | *3* | *3* |
| Unit Extension | *3.0* | | *3.0* | | | | *3.0* | *3.0* | | | *3.0* | *3.0* |
| Ped/Bike/RTOR Volume | *0* | *0* | *40* | | | | *0* | *0* | | *0* | *0* | *0* |
| Lane Width | *12.0* | | *12.0* | | | | *12.0* | *12.0* | | | *12.0* | *12.0* |
| Parking/Grade/Parking | *N* | *0* | *N* | | | | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | | *0* | | | | *0* | *0* | | | *0* | *0* |
| Minimum Pedestrian Time | | *3.2* | | | | | | *3.2* | | | *3.2* | |

| Phasing | EB Only | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *20.0* | G = | G = | G = | G = *90.0* | G = | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |
| Duration of Analysis (hrs) = *0.25* | | | | | | Cycle Length C = *120.0* | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *19* | | *318* | | | | *262* | *2058* | | | *588* | *612* |
| Lane Group Capacity | *276* | | *2623* | | | | *545* | *2444* | | | *2444* | *1455* |
| v/c Ratio | *0.07* | | *0.12* | | | | *0.48* | *0.84* | | | *0.24* | *0.42* |
| Green Ratio | *0.17* | | *1.00* | | | | *0.75* | *0.75* | | | *0.75* | *1.00* |
| Uniform Delay $d_1$ | *42.2* | | *0.0* | | | | *5.9* | *10.2* | | | *4.6* | *0.0* |
| Delay Factor k | *0.11* | | *0.11* | | | | *0.11* | *0.38* | | | *0.11* | *0.11* |
| Incremental Delay $d_2$ | *0.1* | | *0.0* | | | | *0.7* | *2.8* | | | *0.1* | *0.2* |
| PF Factor | *1.000* | | *0.950* | | | | *1.000* | *1.000* | | | *1.000* | *0.950* |
| Control Delay | *42.3* | | *0.0* | | | | *6.5* | *13.0* | | | *4.6* | *0.2* |
| Lane Group LOS | *D* | | *A* | | | | *A* | *B* | | | *A* | *A* |
| Approach Delay | *2.4* | | | | | | *12.3* | | | *2.4* | | |
| Approach LOS | *A* | | | | | | *B* | | | *A* | | |
| Intersection Delay | *8.3* | | | Intersection LOS | | | | | | *A* | | |

# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | KNM | Intersection | US 17/92 and I-4 EB Ramps |
| Agency or Co. | HNTB | | |
| Date Performed | 3/24/08 | Area Type | All other areas |
| Time Period | Build I-4 Connection @ SR 417 | Jurisdiction | Seminole County |
| | | Analysis Year | 2022 No Build |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | 2 | | | 1 | 1 | 1 | 1 | 2 | | | 2 | 1 |
| Lane Group | L | | | L | T | R | L | T | | | T | R |
| Volume (vph) | 953 | | | 58 | 41 | 73 | 220 | 520 | | | 469 | 432 |
| % Heavy Vehicles | 2 | | | 9 | 9 | 9 | 11 | 11 | | | 11 | 11 |
| PHF | 0.95 | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | 0.95 | 0.95 |
| Pretimed/Actuated (P/A) | A | | | A | A | A | A | A | | | A | A |
| Startup Lost Time | 2.0 | | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | 2.0 | 2.0 |
| Extension of Effective Green | 2.0 | | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | 2.0 | 2.0 |
| Arrival Type | 3 | | | 3 | 3 | 3 | 3 | 3 | | | 3 | 3 |
| Unit Extension | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Ped/Bike/RTOR Volume | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Lane Width | 12.0 | | | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | | 12.0 | 12.0 |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Minimum Pedestrian Time | | 3.2 | | | 3.2 | | | 3.2 | | | 3.2 | |

| Phasing | Excl. Left | WB Only | 03 | 04 | NB Only | NS Perm | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 40.0 | G = 15.0 | G = | G = | G = 20.0 | G = 30.0 | G = | G = |
| | Y = 5 | Y = 5 | Y = | Y = | Y = 0 | Y = 5 | Y = | Y = |
| Duration of Analysis (hrs) = 0.25 | | | | | | Cycle Length C = 120.0 | | |

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | 1003 | | | 61 | 43 | 77 | 232 | 547 | | | 494 | 455 |
| Lane Group Capacity | 1146 | | | 828 | 218 | 864 | 405 | 1358 | | | 815 | 1152 |
| v/c Ratio | 0.88 | | | 0.07 | 0.20 | 0.09 | 0.57 | 0.40 | | | 0.61 | 0.39 |
| Green Ratio | 0.33 | | | 0.50 | 0.13 | 0.58 | 0.46 | 0.42 | | | 0.25 | 0.79 |
| Uniform Delay $d_1$ | 37.7 | | | 15.6 | 47.1 | 11.0 | 21.9 | 24.5 | | | 39.8 | 3.8 |
| Delay Factor k | 0.40 | | | 0.11 | 0.11 | 0.11 | 0.17 | 0.11 | | | 0.19 | 0.11 |
| Incremental Delay $d_2$ | 7.8 | | | 0.0 | 0.4 | 0.0 | 2.0 | 0.2 | | | 1.3 | 0.2 |
| PF Factor | 1.000 | | | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | | 1.000 | 1.000 |
| Control Delay | 45.4 | | | 15.6 | 47.5 | 11.0 | 23.8 | 24.7 | | | 41.1 | 4.0 |
| Lane Group LOS | D | | | B | D | B | C | C | | | D | A |
| Approach Delay | 45.4 | | | 21.3 | | | 24.5 | | | 23.3 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| Intersection Delay | 31.1 | | | Intersection LOS | | | | | | C | | |

# SHORT REPORT

**General Information**

| | |
|---|---|
| Analyst | *KNM* |
| Agency or Co. | *HNTB* |
| Date Performed | *3/24/08* |
| Time Period | *Build I-4 Connection @ SR 417* |

**Site Information**

| | |
|---|---|
| Intersection | *CR 15 @ Orange Blvd* |
| Area Type | *All other areas* |
| Jurisdiction | *Seminole County* |
| Analysis Year | *2022 No Build* |

**Volume and Timing Input**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Number of Lanes | *1* | | *1* | | | | *1* | *1* | | | *1* | *1* |
| Lane Group | *L* | | *R* | | | | *L* | *T* | | | *T* | *R* |
| Volume (vph) | *356* | | *64* | | | | *80* | *920* | | | *392* | *156* |
| % Heavy Vehicles | *2* | | *2* | | | | *2* | *2* | | | *2* | *2* |
| PHF | *0.95* | | *0.95* | | | | *0.95* | *0.95* | | | *0.95* | *0.95* |
| Pretimed/Actuated (P/A) | *A* | | *A* | | | | *A* | *A* | | | *A* | *A* |
| Startup Lost Time | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Extension of Effective Green | *2.0* | | *2.0* | | | | *2.0* | *2.0* | | | *2.0* | *2.0* |
| Arrival Type | *3* | | *3* | | | | *3* | *3* | | | *3* | *3* |
| Unit Extension | *3.0* | | *3.0* | | | | *3.0* | *3.0* | | | *3.0* | *3.0* |
| Ped/Bike/RTOR Volume | *0* | *0* | *40* | | | | *0* | *0* | | *0* | *0* | *0* |
| Lane Width | *12.0* | | *12.0* | | | | *12.0* | *12.0* | | | *12.0* | *12.0* |
| Parking/Grade/Parking | *N* | *0* | *N* | | | | *N* | *0* | *N* | *N* | *0* | *N* |
| Parking/Hour | | | | | | | | | | | | |
| Bus Stops/Hour | *0* | | *0* | | | | *0* | *0* | | | *0* | *0* |
| Minimum Pedestrian Time | | *3.2* | | | | | | *3.2* | | | *3.2* | |

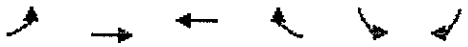
| Phasing | EB Only | 02 | 03 | 04 | NS Perm | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = *30.0* | G = | G = | G = | G = *60.0* | G = | G = | G = |
| | Y = *5* | Y = | Y = | Y = | Y = *5* | Y = | Y = | Y = |

Duration of Analysis (hrs) = *0.25*

Cycle Length C = *100.0*

**Lane Group Capacity, Control Delay, and LOS Determination**

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjusted Flow Rate | *375* | | *25* | | | | *84* | *968* | | | *413* | *164* |
| Lane Group Capacity | *531* | | *1583* | | | | *514* | *1118* | | | *1118* | *950* |
| v/c Ratio | *0.71* | | *0.02* | | | | *0.16* | *0.87* | | | *0.37* | *0.17* |
| Green Ratio | *0.30* | | *1.00* | | | | *0.60* | *0.60* | | | *0.60* | *0.60* |
| Uniform Delay $d_1$ | *31.1* | | *0.0* | | | | *8.9* | *16.6* | | | *10.3* | *8.9* |
| Delay Factor k | *0.27* | | *0.11* | | | | *0.11* | *0.40* | | | *0.11* | *0.11* |
| Incremental Delay $d_2$ | *4.3* | | *0.0* | | | | *0.2* | *7.3* | | | *0.2* | *0.1* |
| PF Factor | *1.000* | | *0.950* | | | | *1.000* | *1.000* | | | *1.000* | *1.000* |
| Control Delay | *35.4* | | *0.0* | | | | *9.0* | *24.0* | | | *10.5* | *9.0* |
| Lane Group LOS | *D* | | *A* | | | | *A* | *C* | | | *B* | *A* |
| Approach Delay | *33.2* | | | | | | *22.8* | | | *10.1* | | |
| Approach LOS | *C* | | | | | | *C* | | | *B* | | |
| Intersection Delay | *21.2* | | | Intersection LOS | | | *C* | | | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.96 | |
| Satd. Flow (prot) | 1770 | 1863 | 1863 | 1583 | 1746 | |
| Flt Permitted | 0.03 | 1.00 | 1.00 | 1.00 | 0.96 | |
| Satd. Flow (perm) | 63 | 1863 | 1863 | 1583 | 1746 | |
| Volume (vph) | 2 | 1368 | 1646 | 14 | 8 | 2 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 2 | 1487 | 1789 | 15 | 9 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 1 | 2 | 0 |
| Lane Group Flow (vph) | 2 | 1487 | 1789 | 14 | 9 | 0 |
| Turn Type | Perm | | | Perm | | |
| Protected Phases | | 2 | 6 | | 4 | |
| Permitted Phases | 2 | | | 6 | | |
| Actuated Green, G (s) | 114.5 | 114.5 | 114.5 | 114.5 | 1.5 | |
| Effective Green, g (s) | 118.0 | 118.0 | 118.0 | 118.0 | 4.0 | |
| Actuated g/C Ratio | 0.91 | 0.91 | 0.91 | 0.91 | 0.03 | |
| Clearance Time (s) | 7.5 | 7.5 | 7.5 | 7.5 | 6.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 57 | 1691 | 1691 | 1437 | 54 | |
| v/s Ratio Prot | | 0.80 | c0.96 | | c0.01 | |
| v/s Ratio Perm | 0.03 | | | 0.01 | | |
| v/c Ratio | 0.04 | 0.88 | 1.06 | 0.01 | 0.17 | |
| Uniform Delay, d1 | 0.6 | 2.7 | 6.0 | 0.6 | 61.4 | |
| Progression Factor | 1.00 | 1.00 | 1.67 | 1.15 | 1.00 | |
| Incremental Delay, d2 | 1.1 | 6.9 | 27.7 | 0.0 | 1.5 | |
| Delay (s) | 1.7 | 9.6 | 37.7 | 0.6 | 62.9 | |
| Level of Service | A | A | D | A | E | |
| Approach Delay (s) | | 9.6 | 37.4 | | 62.9 | |
| Approach LOS | | A | D | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 25.0 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 1.03 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 96.6% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | | 0.93 | |
| Flt Protected | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | | 1737 | |
| Flt Permitted | | 1.00 | 1.00 | 0.04 | 1.00 | 1.00 | 0.76 | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 78 | 1863 | 1583 | 1409 | 1863 | 1583 | | 1737 | |
| Volume (vph) | 0 | 1249 | 121 | 54 | 1445 | 1 | 221 | 2 | 87 | 0 | 1 | 1 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 0 | 1358 | 132 | 59 | 1571 | 1 | 240 | 2 | 95 | 0 | 1 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 1358 | 104 | 59 | 1571 | 1 | 240 | 2 | 15 | 0 | 1 | 0 |
| Turn Type | Perm | | Perm | Perm | | Perm | Perm | | Perm | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | 6 | 8 | | 8 | 4 | | |
| Actuated Green, G (s) | | 99.5 | 99.5 | 99.5 | 99.5 | 99.5 | 17.5 | 17.5 | 17.5 | | 17.5 | |
| Effective Green, g (s) | | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 | 20.0 | 20.0 | 20.0 | | 20.0 | |
| Actuated g/C Ratio | | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.15 | 0.15 | 0.15 | | 0.15 | |
| Clearance Time (s) | | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | 1462 | 1242 | 61 | 1462 | 1242 | 217 | 287 | 244 | | 267 | |
| v/s Ratio Prot | | 0.73 | | | c0.84 | | | 0.00 | | | 0.00 | |
| v/s Ratio Perm | | | 0.07 | 0.75 | | 0.00 | c0.17 | | 0.01 | | | |
| v/c Ratio | | 0.93 | 0.08 | 0.97 | 1.07 | 0.00 | 1.11 | 0.01 | 0.06 | | 0.00 | |
| Uniform Delay, d1 | | 11.1 | 3.2 | 12.5 | 14.0 | 3.0 | 55.0 | 46.6 | 47.0 | | 46.6 | |
| Progression Factor | | 0.85 | 0.48 | 0.37 | 0.48 | 0.27 | 1.00 | 1.00 | 1.00 | | 1.00 | |
| Incremental Delay, d2 | | 7.2 | 0.1 | 27.4 | 35.1 | 0.0 | 92.4 | 0.0 | 0.1 | | 0.0 | |
| Delay (s) | | 16.6 | 1.6 | 32.1 | 41.8 | 0.8 | 147.4 | 46.6 | 47.1 | | 46.6 | |
| Level of Service | | B | A | C | D | A | F | D | D | | D | |
| Approach Delay (s) | | 15.3 | | | 41.4 | | | 118.5 | | | 46.6 | |
| Approach LOS | | B | | | D | | | F | | | D | |

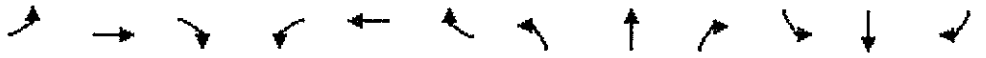
| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 37.7 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 1.08 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 101.6% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NEL | NER |
|---|---|---|---|---|---|---|
| Lane Configurations | ↑ | ↱ | ↰ | ↑ | ↰ | ↱ |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 1.00 | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1863 | 1583 | 1770 | 1863 | 1770 | 1583 |
| Flt Permitted | 1.00 | 1.00 | 0.10 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 1863 | 1583 | 193 | 1863 | 1770 | 1583 |
| Volume (vph) | 1229 | 11 | 59 | 1561 | 75 | 155 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 1336 | 12 | 64 | 1697 | 82 | 168 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 0 | 112 |
| Lane Group Flow (vph) | 1336 | 10 | 64 | 1697 | 82 | 56 |
| Turn Type | | Perm | Perm | | | Perm |
| Protected Phases | 2 | | | 6 | 8 | |
| Permitted Phases | | 2 | 6 | | | 8 |
| Actuated Green, G (s) | 105.2 | 105.2 | 105.2 | 105.2 | 10.8 | 10.8 |
| Effective Green, g (s) | 108.7 | 108.7 | 108.7 | 108.7 | 13.3 | 13.3 |
| Actuated g/C Ratio | 0.84 | 0.84 | 0.84 | 0.84 | 0.10 | 0.10 |
| Clearance Time (s) | 7.5 | 7.5 | 7.5 | 7.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 1558 | 1324 | 161 | 1558 | 181 | 162 |
| v/s Ratio Prot | 0.72 | | | c0.91 | c0.05 | |
| v/s Ratio Perm | | 0.01 | 0.33 | | | 0.04 |
| v/c Ratio | 0.86 | 0.01 | 0.40 | 1.09 | 0.45 | 0.34 |
| Uniform Delay, d1 | 6.2 | 1.8 | 2.6 | 10.6 | 54.9 | 54.3 |
| Progression Factor | 0.10 | 0.13 | 0.44 | 1.20 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.9 | 0.0 | 3.4 | 46.0 | 1.8 | 1.3 |
| Delay (s) | 3.5 | 0.2 | 4.6 | 58.8 | 56.7 | 55.6 |
| Level of Service | A | A | A | E | E | E |
| Approach Delay (s) | 3.5 | | | 56.8 | 55.9 | |
| Approach LOS | A | | | E | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 35.3 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 1.02 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 93.0% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.50 | 1.00 | 1.00 | 0.53 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 922 | 1863 | 1583 | 993 | 1863 | 1583 |
| Volume (vph) | 121 | 1177 | 42 | 125 | 1545 | 200 | 300 | 161 | 99 | 133 | 71 | 100 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 132 | 1279 | 46 | 136 | 1679 | 217 | 326 | 175 | 108 | 145 | 77 | 109 |
| RTOR Reduction (vph) | 0 | 0 | 21 | 0 | 0 | 76 | 0 | 0 | 92 | 0 | 0 | 98 |
| Lane Group Flow (vph) | 132 | 1279 | 25 | 136 | 1679 | 141 | 326 | 175 | 16 | 145 | 77 | 11 |
| Turn Type | Prot | | Perm | Prot | | Perm | pm+pt | | Perm | pm+pt | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | 6 | 8 | | 8 | 4 | | 4 |
| Actuated Green, G (s) | 11.3 | 62.5 | 62.5 | 13.6 | 64.8 | 64.8 | 32.0 | 16.5 | 16.5 | 20.8 | 10.9 | 10.9 |
| Effective Green, g (s) | 13.8 | 66.5 | 66.5 | 16.1 | 68.8 | 68.8 | 35.4 | 19.0 | 19.0 | 25.8 | 13.4 | 13.4 |
| Actuated g/C Ratio | 0.11 | 0.51 | 0.51 | 0.12 | 0.53 | 0.53 | 0.27 | 0.15 | 0.15 | 0.20 | 0.10 | 0.10 |
| Clearance Time (s) | 6.5 | 8.0 | 8.0 | 6.5 | 8.0 | 8.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 188 | 1810 | 810 | 219 | 1873 | 838 | 368 | 272 | 231 | 271 | 192 | 163 |
| v/s Ratio Prot | c0.07 | 0.36 | | 0.08 | c0.47 | | c0.12 | 0.09 | | 0.05 | 0.04 | |
| v/s Ratio Perm | | | 0.02 | | | 0.09 | c0.12 | | 0.01 | 0.06 | | 0.01 |
| v/c Ratio | 0.70 | 0.71 | 0.03 | 0.62 | 0.90 | 0.17 | 0.89 | 0.64 | 0.07 | 0.54 | 0.40 | 0.07 |
| Uniform Delay, d1 | 56.1 | 24.3 | 15.8 | 54.1 | 27.4 | 15.8 | 43.2 | 52.3 | 47.9 | 45.5 | 54.5 | 52.7 |
| Progression Factor | 1.10 | 0.72 | 0.52 | 0.85 | 0.67 | 1.09 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 6.3 | 1.3 | 0.0 | 2.5 | 3.5 | 0.2 | 21.6 | 5.1 | 0.1 | 2.0 | 1.4 | 0.2 |
| Delay (s) | 68.1 | 18.7 | 8.3 | 48.4 | 22.0 | 17.5 | 64.8 | 57.4 | 48.0 | 47.5 | 55.9 | 52.8 |
| Level of Service | E | B | A | D | C | B | E | E | D | D | E | D |
| Approach Delay (s) | | 22.9 | | | 23.3 | | | 59.7 | | | 51.2 | |
| Approach LOS | | C | | | C | | | E | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 30.2 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 3539 | 1583 | 1770 | 1583 |
| Flt Permitted | 0.10 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 179 | 3539 | 3539 | 1583 | 1770 | 1583 |
| Volume (vph) | 41 | 1509 | 1876 | 374 | 271 | 59 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 45 | 1640 | 2039 | 407 | 295 | 64 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 146 | 0 | 10 |
| Lane Group Flow (vph) | 45 | 1640 | 2039 | 261 | 295 | 54 |
| Turn Type | Perm | | | Perm | | Perm |
| Protected Phases | | 2 | 6 | | 4 | |
| Permitted Phases | 2 | | | 6 | | 4 |
| Actuated Green, G (s) | 38.2 | 38.2 | 38.2 | 38.2 | 12.8 | 12.8 |
| Effective Green, g (s) | 41.7 | 41.7 | 41.7 | 41.7 | 15.3 | 15.3 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.64 | 0.64 | 0.24 | 0.24 |
| Clearance Time (s) | 7.5 | 7.5 | 7.5 | 7.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 115 | 2270 | 2270 | 1016 | 417 | 373 |
| v/s Ratio Prot | | 0.46 | c0.58 | | c0.17 | |
| v/s Ratio Perm | 0.25 | | | 0.16 | | 0.03 |
| v/c Ratio | 0.39 | 0.72 | 0.90 | 0.26 | 0.71 | 0.14 |
| Uniform Delay, d1 | 5.6 | 7.8 | 9.9 | 5.0 | 22.8 | 19.7 |
| Progression Factor | 0.84 | 0.87 | 0.82 | 1.76 | 1.00 | 1.00 |
| Incremental Delay, d2 | 7.8 | 1.6 | 4.2 | 0.4 | 5.4 | 0.2 |
| Delay (s) | 12.5 | 8.4 | 12.3 | 9.2 | 28.2 | 19.9 |
| Level of Service | B | A | B | A | C | B |
| Approach Delay (s) | | 8.5 | 11.8 | | 26.7 | |
| Approach LOS | | A | B | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 11.7 | HCM Level of Service | B |
| HCM Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 65.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 73.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 0.95 | 1.00 | 0.97 | 0.95 | 0.97 | 0.88 |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 1.00 | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 3539 | 1583 | 3433 | 3539 | 3433 | 2787 |
| Flt Permitted | 1.00 | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 3539 | 1583 | 3433 | 3539 | 3433 | 2787 |
| Volume (vph) | 1677 | 183 | 181 | 1869 | 399 | 351 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 1823 | 199 | 197 | 2032 | 434 | 382 |
| RTOR Reduction (vph) | 0 | 73 | 0 | 0 | 0 | 210 |
| Lane Group Flow (vph) | 1823 | 126 | 197 | 2032 | 434 | 172 |
| Turn Type | | Perm | Prot | | | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Actuated Green, G (s) | 79.4 | 79.4 | 10.3 | 96.2 | 19.8 | 19.8 |
| Effective Green, g (s) | 82.4 | 82.4 | 12.8 | 99.2 | 22.8 | 22.8 |
| Actuated g/C Ratio | 0.63 | 0.63 | 0.10 | 0.76 | 0.18 | 0.18 |
| Clearance Time (s) | 7.0 | 7.0 | 6.5 | 7.0 | 7.0 | 7.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 2243 | 1003 | 338 | 2701 | 602 | 489 |
| v/s Ratio Prot | c0.52 | | 0.06 | c0.57 | c0.13 | |
| v/s Ratio Perm | | 0.08 | | | | 0.06 |
| v/c Ratio | 0.81 | 0.13 | 0.58 | 0.75 | 0.72 | 0.35 |
| Uniform Delay, d1 | 18.0 | 9.5 | 56.0 | 8.6 | 50.6 | 47.1 |
| Progression Factor | 0.68 | 0.49 | 1.35 | 0.02 | 0.62 | 0.49 |
| Incremental Delay, d2 | 2.4 | 0.2 | 0.9 | 0.7 | 4.0 | 0.4 |
| Delay (s) | 14.6 | 4.8 | 76.6 | 0.9 | 35.4 | 23.6 |
| Level of Service | B | A | E | A | D | C |
| Approach Delay (s) | 13.7 | | | 7.6 | 29.9 | |
| Approach LOS | B | | | A | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 13.6 | HCM Level of Service | B |
| HCM Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 72.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.96 | 1.00 |
| Satd. Flow (prot) | 1770 | 5084 | | 1770 | 3539 | 1583 | 1770 | 1863 | 1583 | 1681 | 1693 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.64 | 1.00 | 1.00 | 0.46 | 0.45 | 1.00 |
| Satd. Flow (perm) | 1770 | 5084 | | 1770 | 3539 | 1583 | 1187 | 1863 | 1583 | 817 | 797 | 1583 |
| Volume (vph) | 111 | 1585 | 4 | 63 | 2044 | 303 | 20 | 84 | 182 | 324 | 16 | 50 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 121 | 1723 | 4 | 68 | 2222 | 329 | 22 | 91 | 198 | 352 | 17 | 54 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 95 | 0 | 0 | 94 | 0 | 0 | 46 |
| Lane Group Flow (vph) | 121 | 1727 | 0 | 68 | 2222 | 234 | 22 | 91 | 104 | 187 | 182 | 8 |
| Turn Type | Prot | | | Prot | | Perm | pm+pt | | Perm | pm+pt | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | | | | 6 | 8 | | 8 | 4 | | 4 |
| Actuated Green, G (s) | 6.9 | 78.3 | | 6.0 | 77.4 | 77.4 | 13.8 | 11.7 | 11.7 | 22.6 | 22.6 | 16.1 |
| Effective Green, g (s) | 9.4 | 82.3 | | 8.5 | 81.4 | 81.4 | 18.8 | 14.2 | 14.2 | 27.2 | 27.2 | 18.6 |
| Actuated g/C Ratio | 0.07 | 0.63 | | 0.07 | 0.63 | 0.63 | 0.14 | 0.11 | 0.11 | 0.21 | 0.21 | 0.14 |
| Clearance Time (s) | 6.5 | 8.0 | | 6.5 | 8.0 | 8.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 128 | 3219 | | 116 | 2216 | 991 | 192 | 203 | 173 | 231 | 229 | 226 |
| v/s Ratio Prot | c0.07 | 0.34 | | 0.04 | c0.63 | | 0.00 | 0.05 | | c0.06 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.15 | 0.01 | | 0.07 | c0.11 | 0.11 | 0.00 |
| v/c Ratio | 0.95 | 0.54 | | 0.59 | 1.00 | 0.24 | 0.11 | 0.45 | 0.60 | 0.81 | 0.79 | 0.03 |
| Uniform Delay, d1 | 60.0 | 13.3 | | 59.0 | 24.3 | 10.7 | 48.2 | 54.2 | 55.2 | 47.8 | 48.8 | 48.0 |
| Progression Factor | 1.06 | 1.02 | | 1.03 | 0.60 | 0.55 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 47.0 | 0.4 | | 3.6 | 13.9 | 0.3 | 0.3 | 1.6 | 5.5 | 18.5 | 17.1 | 0.1 |
| Delay (s) | 110.6 | 13.9 | | 64.7 | 28.5 | 6.2 | 48.4 | 55.8 | 60.7 | 66.3 | 65.9 | 48.0 |
| Level of Service | F | B | | E | C | A | D | E | E | E | E | D |
| Approach Delay (s) | | 20.2 | | | 26.6 | | | 58.4 | | | 63.8 | |
| Approach LOS | | C | | | C | | | E | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 29.3 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 88.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SBL2 | SBL | SBR | NWL | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | | 4.0 | | 4.0 | | 4.0 | | |
| Lane Util. Factor | | 0.95 | 1.00 | | 0.95 | | 0.97 | | 0.88 | | |
| Frt | | 1.00 | 0.85 | | 1.00 | | 1.00 | | 0.85 | | |
| Flt Protected | | 1.00 | 1.00 | | 1.00 | | 0.95 | | 1.00 | | |
| Satd. Flow (prot) | | 3539 | 1583 | | 3539 | | 3433 | | 2787 | | |
| Flt Permitted | | 1.00 | 1.00 | | 1.00 | | 0.95 | | 1.00 | | |
| Satd. Flow (perm) | | 3539 | 1583 | | 3539 | | 3433 | | 2787 | | |
| Volume (vph) | 0 | 1250 | 740 | 0 | 1967 | 0 | 798 | 0 | 452 | 0 | 0 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 0 | 1359 | 804 | 0 | 2138 | 0 | 867 | 0 | 491 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 275 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 1359 | 529 | 0 | 2138 | 0 | 867 | 0 | 475 | 0 | 0 |
| Turn Type | | | Perm | | | | Prot | | custom | | |
| Protected Phases | | 2 | | | 6 | | 4 | | | | |
| Permitted Phases | | | 2 | | | | | | 4 | | |
| Actuated Green, G (s) | | 83.0 | 83.0 | | 83.0 | | 34.0 | | 34.0 | | |
| Effective Green, g (s) | | 85.5 | 85.5 | | 85.5 | | 36.5 | | 36.5 | | |
| Actuated g/C Ratio | | 0.66 | 0.66 | | 0.66 | | 0.28 | | 0.28 | | |
| Clearance Time (s) | | 6.5 | 6.5 | | 6.5 | | 6.5 | | 6.5 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 2328 | 1041 | | 2328 | | 964 | | 783 | | |
| v/s Ratio Prot | | 0.38 | | | c0.60 | | c0.25 | | | | |
| v/s Ratio Perm | | | 0.33 | | | | | | 0.17 | | |
| v/c Ratio | | 0.58 | 0.51 | | 0.92 | | 0.90 | | 0.61 | | |
| Uniform Delay, d1 | | 12.4 | 11.4 | | 19.2 | | 45.0 | | 40.5 | | |
| Progression Factor | | 0.40 | 3.72 | | 0.33 | | 1.00 | | 1.00 | | |
| Incremental Delay, d2 | | 0.9 | 1.5 | | 4.7 | | 11.1 | | 1.3 | | |
| Delay (s) | | 5.8 | 44.0 | | 11.0 | | 56.0 | | 41.9 | | |
| Level of Service | | A | D | | B | | E | | D | | |
| Approach Delay (s) | | 20.0 | | | 11.0 | | | 50.9 | | 0.0 | |
| Approach LOS | | C | | | B | | | D | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 24.0 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 76.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | | 4.0 | | | |
| Lane Util. Factor | 0.97 | 0.95 | | | 0.91 | 1.00 | 0.97 | | 0.88 | | | |
| Frt | 1.00 | 1.00 | | | 1.00 | 0.85 | 1.00 | | 0.85 | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | 1.00 | 0.95 | | 1.00 | | | |
| Satd. Flow (prot) | 3433 | 3539 | | | 5085 | 1583 | 3433 | | 2787 | | | |
| Flt Permitted | 0.95 | 1.00 | | | 1.00 | 1.00 | 0.95 | | 1.00 | | | |
| Satd. Flow (perm) | 3433 | 3539 | | | 5085 | 1583 | 3433 | | 2787 | | | |
| Volume (vph) | 374 | 1674 | 0 | 0 | 2234 | 876 | 493 | 0 | 617 | 0 | 0 | 0 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 407 | 1820 | 0 | 0 | 2428 | 952 | 536 | 0 | 671 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 326 | 0 | 0 | 43 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 407 | 1820 | 0 | 0 | 2428 | 626 | 536 | 0 | 628 | 0 | 0 | 0 |
| Turn Type | Prot | | | | | Perm | custom | | custom | | | |
| Protected Phases | 5! | 2! | | | 6! | | | | | | | |
| Permitted Phases | | | | | | 6 | 2! | | 8 | | | |
| Actuated Green, G (s) | 15.5 | 88.5 | | | 66.5 | 66.5 | 88.5 | | 28.5 | | | |
| Effective Green, g (s) | 18.0 | 91.0 | | | 69.0 | 69.0 | 91.0 | | 31.0 | | | |
| Actuated g/C Ratio | 0.14 | 0.70 | | | 0.53 | 0.53 | 0.70 | | 0.24 | | | |
| Clearance Time (s) | 6.5 | 6.5 | | | 6.5 | 6.5 | 6.5 | | 6.5 | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 475 | 2477 | | | 2699 | 840 | 2403 | | 665 | | | |
| v/s Ratio Prot | c0.12 | 0.51 | | | c0.48 | | | | | | | |
| v/s Ratio Perm | | | | | | 0.40 | 0.16 | | c0.23 | | | |
| v/c Ratio | 0.86 | 0.73 | | | 0.90 | 0.75 | 0.22 | | 0.94 | | | |
| Uniform Delay, d1 | 54.7 | 12.0 | | | 27.4 | 23.7 | 6.9 | | 48.6 | | | |
| Progression Factor | 1.16 | 0.73 | | | 0.52 | 1.84 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | 10.4 | 1.4 | | | 2.7 | 2.9 | 0.2 | | 23.5 | | | |
| Delay (s) | 73.7 | 10.1 | | | 16.9 | 46.4 | 7.1 | | 72.2 | | | |
| Level of Service | E | B | | | B | D | A | | E | | | |
| Approach Delay (s) | | 21.8 | | | 25.2 | | | 43.3 | | | 0.0 | |
| Approach LOS | | C | | | C | | | D | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 27.3 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 77.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

! Phase conflict between lane groups.
c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.91 | 1.00 | 0.97 | 0.86 | 1.00 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 5085 | 1583 | 3433 | 6408 | 1583 | 3433 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 5085 | 1583 | 3433 | 6408 | 1583 | 3433 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Volume (vph) | 282 | 1488 | 800 | 305 | 2042 | 133 | 661 | 61 | 244 | 132 | 57 | 184 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 307 | 1617 | 870 | 332 | 2220 | 145 | 718 | 66 | 265 | 143 | 62 | 200 |
| RTOR Reduction (vph) | 0 | 0 | 360 | 0 | 0 | 92 | 0 | 0 | 214 | 0 | 0 | 181 |
| Lane Group Flow (vph) | 307 | 1617 | 510 | 332 | 2220 | 53 | 718 | 66 | 51 | 143 | 62 | 19 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | Perm | Prot | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | 8 | | | 4 |
| Actuated Green, G (s) | 24.0 | 53.4 | 53.4 | 15.2 | 44.6 | 44.6 | 25.7 | 21.2 | 21.2 | 14.2 | 9.7 | 9.7 |
| Effective Green, g (s) | 26.5 | 55.9 | 55.9 | 17.7 | 47.1 | 47.1 | 28.2 | 23.7 | 23.7 | 16.7 | 12.2 | 12.2 |
| Actuated g/C Ratio | 0.20 | 0.43 | 0.43 | 0.14 | 0.36 | 0.36 | 0.22 | 0.18 | 0.18 | 0.13 | 0.09 | 0.09 |
| Clearance Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 361 | 2187 | 681 | 467 | 2322 | 574 | 745 | 340 | 289 | 227 | 175 | 149 |
| v/s Ratio Prot | c0.17 | 0.32 | | 0.10 | c0.35 | | c0.21 | 0.04 | | 0.08 | c0.03 | |
| v/s Ratio Perm | | | 0.32 | | | 0.03 | | | 0.03 | | | 0.01 |
| v/c Ratio | 0.85 | 0.74 | 0.75 | 0.71 | 0.96 | 0.09 | 0.96 | 0.19 | 0.18 | 0.63 | 0.35 | 0.13 |
| Uniform Delay, d1 | 49.8 | 31.0 | 31.2 | 53.7 | 40.4 | 27.3 | 50.4 | 45.1 | 44.9 | 53.7 | 55.2 | 54.0 |
| Progression Factor | 1.09 | 0.89 | 0.67 | 1.06 | 0.84 | 1.16 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 12.6 | 1.6 | 5.2 | 2.8 | 6.9 | 0.2 | 24.2 | 0.3 | 0.3 | 5.4 | 1.2 | 0.4 |
| Delay (s) | 66.8 | 29.2 | 26.0 | 59.7 | 40.8 | 31.9 | 74.6 | 45.3 | 45.2 | 59.1 | 56.4 | 54.4 |
| Level of Service | E | C | C | E | D | C | E | D | D | E | E | D |
| Approach Delay (s) | | 32.3 | | | 42.6 | | | 65.3 | | | 56.4 | |
| Approach LOS | | C | | | D | | | E | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 42.7 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 80.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.91 | 1.00 | 0.97 | 0.91 | 1.00 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 5085 | 1583 | 3433 | 5085 | 1583 | 3433 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 5085 | 1583 | 3433 | 5085 | 1583 | 3433 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Volume (vph) | 62 | 1626 | 362 | 496 | 1771 | 13 | 739 | 71 | 510 | 41 | 37 | 145 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 67 | 1767 | 393 | 539 | 1925 | 14 | 803 | 77 | 554 | 45 | 40 | 158 |
| RTOR Reduction (vph) | 0 | 0 | 158 | 0 | 0 | 7 | 0 | 0 | 241 | 0 | 0 | 57 |
| Lane Group Flow (vph) | 67 | 1767 | 235 | 539 | 1925 | 7 | 803 | 77 | 313 | 45 | 40 | 101 |
| Turn Type | Prot | | Perm | Prot | | Perm | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | 8 | | | 4 |
| Actuated Green, G (s) | 3.6 | 44.5 | 44.5 | 18.5 | 59.4 | 59.4 | 29.6 | 29.6 | 29.6 | 11.4 | 11.4 | 11.4 |
| Effective Green, g (s) | 6.1 | 47.0 | 47.0 | 21.0 | 61.9 | 61.9 | 32.1 | 32.1 | 32.1 | 13.9 | 13.9 | 13.9 |
| Actuated g/C Ratio | 0.05 | 0.36 | 0.36 | 0.16 | 0.48 | 0.48 | 0.25 | 0.25 | 0.25 | 0.11 | 0.11 | 0.11 |
| Clearance Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 83 | 1838 | 572 | 555 | 2421 | 754 | 848 | 460 | 391 | 189 | 199 | 169 |
| v/s Ratio Prot | 0.04 | c0.35 | | c0.16 | 0.38 | | c0.23 | 0.04 | | 0.03 | 0.02 | |
| v/s Ratio Perm | | | 0.15 | | | 0.00 | | | 0.20 | | | c0.06 |
| v/c Ratio | 0.81 | 0.96 | 0.41 | 0.97 | 0.80 | 0.01 | 0.95 | 0.17 | 0.80 | 0.24 | 0.20 | 0.60 |
| Uniform Delay, d1 | 61.4 | 40.6 | 31.1 | 54.2 | 28.7 | 17.9 | 48.1 | 38.5 | 45.9 | 53.2 | 53.0 | 55.4 |
| Progression Factor | 1.16 | 0.50 | 0.27 | 1.00 | 1.00 | 1.00 | 0.62 | 0.58 | 0.55 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 34.2 | 11.4 | 1.7 | 30.8 | 2.8 | 0.0 | 16.7 | 0.1 | 9.4 | 0.7 | 0.5 | 5.6 |
| Delay (s) | 105.1 | 31.7 | 9.9 | 85.0 | 31.5 | 17.9 | 46.5 | 22.6 | 34.6 | 53.9 | 53.5 | 60.9 |
| Level of Service | F | C | A | F | C | B | D | C | C | D | D | E |
| Approach Delay (s) | | 30.1 | | | 43.1 | | | 40.6 | | | 58.4 | |
| Approach LOS | | C | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 38.6 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 83.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 105 | 517 | 38 | 308 | 658 | 384 | 192 | 949 | 1458 | 305 | 454 | 191 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 114 | 562 | 41 | 335 | 715 | 417 | 209 | 1032 | 1585 | 332 | 493 | 208 |
| RTOR Reduction (vph) | 0 | 0 | 35 | 0 | 0 | 165 | 0 | 0 | 80 | 0 | 0 | 105 |
| Lane Group Flow (vph) | 114 | 562 | 6 | 335 | 715 | 252 | 209 | 1032 | 1505 | 332 | 493 | 103 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | Perm | Prot | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | 8 | | | 4 |
| Actuated Green, G (s) | 5.5 | 18.5 | 18.5 | 8.5 | 21.5 | 21.5 | 20.4 | 78.5 | 78.5 | 8.5 | 66.6 | 66.6 |
| Effective Green, g (s) | 8.0 | 21.0 | 21.0 | 11.0 | 24.0 | 24.0 | 22.9 | 81.0 | 81.0 | 11.0 | 69.1 | 69.1 |
| Actuated g/C Ratio | 0.06 | 0.15 | 0.15 | 0.08 | 0.17 | 0.17 | 0.16 | 0.58 | 0.58 | 0.08 | 0.49 | 0.49 |
| Clearance Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 101 | 531 | 237 | 270 | 607 | 271 | 290 | 2048 | 916 | 270 | 1747 | 781 |
| v/s Ratio Prot | 0.06 | 0.16 | | c0.10 | c0.20 | | 0.12 | 0.29 | | c0.10 | 0.14 | |
| v/s Ratio Perm | | | 0.00 | | | 0.16 | | | c0.95 | | | 0.06 |
| v/c Ratio | 1.13 | 1.06 | 0.03 | 1.24 | 1.18 | 0.93 | 0.72 | 0.50 | 1.64 | 1.23 | 0.28 | 0.13 |
| Uniform Delay, d1 | 66.0 | 59.5 | 50.8 | 64.5 | 58.0 | 57.2 | 55.5 | 17.5 | 29.5 | 64.5 | 20.9 | 19.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 0.74 | 0.69 | 0.85 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 128.4 | 55.4 | 0.2 | 126.6 | 90.8 | 28.7 | 8.5 | 0.2 | 294.5 | 131.4 | 0.1 | 0.1 |
| Delay (s) | 194.4 | 114.9 | 51.0 | 174.4 | 130.8 | 77.4 | 64.0 | 17.7 | 324.0 | 195.9 | 20.9 | 19.3 |
| Level of Service | F | F | D | F | F | E | E | B | F | F | C | B |
| Approach Delay (s) | | 123.9 | | | 125.6 | | | 192.9 | | | 76.8 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 148.5 | HCM Level of Service | F |
| HCM Volume to Capacity ratio | 1.51 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 123.3% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.95 | 0.95 | 0.88 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 | 1681 | 1721 | 2787 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 3433 | 3539 | 1583 | 1681 | 1721 | 2787 | 1770 | 1863 | 1583 |
| Volume (vph) | 35 | 1960 | 576 | 637 | 1471 | 69 | 179 | 51 | 480 | 350 | 307 | 39 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 38 | 2130 | 626 | 692 | 1599 | 75 | 195 | 55 | 522 | 380 | 334 | 42 |
| RTOR Reduction (vph) | 0 | 0 | 193 | 0 | 0 | 33 | 0 | 0 | 23 | 0 | 0 | 35 |
| Lane Group Flow (vph) | 38 | 2130 | 433 | 692 | 1599 | 42 | 122 | 128 | 499 | 380 | 334 | 8 |
| Turn Type | Prot | | Perm | Prot | | Perm | Split | | pt+ov | Split | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | 8 1 | 4 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | | | | 4 |
| Actuated Green, G (s) | 3.2 | 59.5 | 59.5 | 19.5 | 75.8 | 75.8 | 14.5 | 14.5 | 39.5 | 23.5 | 23.5 | 23.5 |
| Effective Green, g (s) | 4.7 | 62.0 | 62.0 | 21.0 | 78.3 | 78.3 | 16.0 | 16.0 | 41.0 | 25.0 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.03 | 0.44 | 0.44 | 0.15 | 0.56 | 0.56 | 0.11 | 0.11 | 0.29 | 0.18 | 0.18 | 0.18 |
| Clearance Time (s) | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 | 5.5 | 5.5 | | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 59 | 1567 | 701 | 515 | 1979 | 885 | 192 | 197 | 816 | 316 | 333 | 283 |
| v/s Ratio Prot | 0.02 | c0.60 | | c0.20 | 0.45 | | 0.07 | 0.07 | c0.18 | c0.21 | 0.18 | |
| v/s Ratio Perm | | | 0.27 | | | 0.03 | | | | | | 0.00 |
| v/c Ratio | 0.64 | 1.36 | 0.62 | 1.34 | 0.81 | 0.05 | 0.64 | 0.65 | 0.61 | 1.20 | 1.00 | 0.03 |
| Uniform Delay, d1 | 66.8 | 39.0 | 29.9 | 59.5 | 24.8 | 14.0 | 59.2 | 59.3 | 42.6 | 57.5 | 57.5 | 47.5 |
| Progression Factor | 1.02 | 0.93 | 0.86 | 0.72 | 1.52 | 2.89 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.2 | 162.1 | 0.4 | 160.5 | 1.7 | 0.0 | 6.7 | 7.2 | 1.4 | 117.4 | 50.1 | 0.0 |
| Delay (s) | 70.5 | 198.4 | 26.2 | 203.6 | 39.3 | 40.4 | 65.9 | 66.5 | 44.0 | 174.9 | 107.6 | 47.5 |
| Level of Service | E | F | C | F | D | D | E | E | D | F | F | D |
| Approach Delay (s) | | 158.1 | | | 87.4 | | | 51.2 | | | 138.1 | |
| Approach LOS | | F | | | F | | | D | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 118.5 | HCM Level of Service | F |
| HCM Volume to Capacity ratio | 1.24 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 111.4% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | | 4.0 | 4.0 | 4.0 | | 4.0 | | | |
| Lane Util. Factor | 0.97 | 0.95 | | | 0.95 | 1.00 | 0.97 | | 0.88 | | | |
| Frt | 1.00 | 1.00 | | | 1.00 | 0.85 | 1.00 | | 0.85 | | | |
| Flt Protected | 0.95 | 1.00 | | | 1.00 | 1.00 | 0.95 | | 1.00 | | | |
| Satd. Flow (prot) | 3433 | 3539 | | | 3539 | 1583 | 3433 | | 2787 | | | |
| Flt Permitted | 0.95 | 1.00 | | | 1.00 | 1.00 | 0.95 | | 1.00 | | | |
| Satd. Flow (perm) | 3433 | 3539 | | | 3539 | 1583 | 3433 | | 2787 | | | |
| Volume (vph) | 275 | 2515 | 0 | 0 | 1653 | 335 | 524 | 0 | 996 | 0 | 0 | 0 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 299 | 2734 | 0 | 0 | 1797 | 364 | 570 | 0 | 1083 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 109 | 0 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 299 | 2734 | 0 | 0 | 1797 | 255 | 570 | 0 | 1080 | 0 | 0 | 0 |
| Turn Type | Prot | | | | | Perm | Prot | | custom | | | |
| Protected Phases | 5 | 2 | | | 6 | | 3 | | 8 | | | |
| Permitted Phases | | | | | | 6 | | | | | | |
| Actuated Green, G (s) | 11.1 | 85.0 | | | 68.4 | 68.4 | 42.5 | | 42.5 | | | |
| Effective Green, g (s) | 12.6 | 88.0 | | | 71.4 | 71.4 | 44.0 | | 44.0 | | | |
| Actuated g/C Ratio | 0.09 | 0.63 | | | 0.51 | 0.51 | 0.31 | | 0.31 | | | |
| Clearance Time (s) | 5.5 | 7.0 | | | 7.0 | 7.0 | 5.5 | | 5.5 | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | 309 | 2225 | | | 1805 | 807 | 1079 | | 876 | | | |
| v/s Ratio Prot | 0.09 | c0.77 | | | 0.51 | | 0.17 | | c0.39 | | | |
| v/s Ratio Perm | | | | | | 0.16 | | | | | | |
| v/c Ratio | 0.97 | 1.23 | | | 1.00 | 0.32 | 0.53 | | 1.23 | | | |
| Uniform Delay, d1 | 63.5 | 26.0 | | | 34.1 | 20.0 | 39.5 | | 48.0 | | | |
| Progression Factor | 1.00 | 0.69 | | | 0.32 | 0.01 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | 9.0 | 103.3 | | | 5.4 | 0.1 | 0.5 | | 114.9 | | | |
| Delay (s) | 72.6 | 121.3 | | | 16.5 | 0.3 | 39.9 | | 162.9 | | | |
| Level of Service | E | F | | | B | A | D | | F | | | |
| Approach Delay (s) | | 116.5 | | | 13.8 | | | 120.5 | | | 0.0 | |
| Approach LOS | | F | | | B | | | F | | | A | |

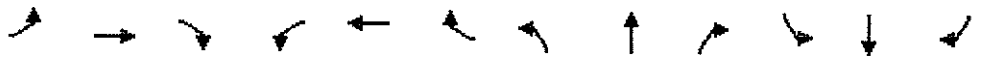
| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 85.1 | HCM Level of Service | F |
| HCM Volume to Capacity ratio | 1.23 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 111.0% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Volume (vph) | 1136 | 1591 | 784 | 300 | 625 | 115 | 929 | 906 | 455 | 117 | 684 | 434 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 1235 | 1729 | 852 | 326 | 679 | 125 | 1010 | 985 | 495 | 127 | 743 | 472 |
| RTOR Reduction (vph) | 0 | 0 | 288 | 0 | 0 | 100 | 0 | 0 | 127 | 0 | 0 | 351 |
| Lane Group Flow (vph) | 1235 | 1729 | 564 | 326 | 679 | 25 | 1010 | 985 | 368 | 127 | 743 | 121 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | Perm | Prot | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | 8 | | | 4 |
| Actuated Green, G (s) | 37.5 | 53.5 | 53.5 | 9.5 | 25.5 | 25.5 | 30.5 | 41.2 | 41.2 | 11.8 | 22.5 | 22.5 |
| Effective Green, g (s) | 39.0 | 56.0 | 56.0 | 11.0 | 28.0 | 28.0 | 32.0 | 43.7 | 43.7 | 13.3 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.28 | 0.40 | 0.40 | 0.08 | 0.20 | 0.20 | 0.23 | 0.31 | 0.31 | 0.10 | 0.18 | 0.18 |
| Clearance Time (s) | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 956 | 1416 | 633 | 270 | 708 | 317 | 785 | 1105 | 494 | 168 | 632 | 283 |
| v/s Ratio Prot | c0.36 | c0.49 | | 0.09 | 0.19 | | c0.29 | 0.28 | | 0.07 | c0.21 | |
| v/s Ratio Perm | | | 0.36 | | | 0.02 | | | 0.23 | | | 0.08 |
| v/c Ratio | 1.29 | 1.22 | 0.89 | 1.21 | 0.96 | 0.08 | 1.29 | 0.89 | 0.74 | 0.76 | 1.18 | 0.43 |
| Uniform Delay, d1 | 50.5 | 42.0 | 39.2 | 64.5 | 55.4 | 45.5 | 54.0 | 45.9 | 43.1 | 61.8 | 57.5 | 51.1 |
| Progression Factor | 1.01 | 1.10 | 1.26 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 132.1 | 100.1 | 2.0 | 122.8 | 25.2 | 0.5 | 138.6 | 9.3 | 6.0 | 17.5 | 94.9 | 1.0 |
| Delay (s) | 183.3 | 146.4 | 51.5 | 187.3 | 80.6 | 46.0 | 192.6 | 55.2 | 49.2 | 79.2 | 152.4 | 52.2 |
| Level of Service | F | F | D | F | F | D | F | E | D | E | F | D |
| Approach Delay (s) | | 137.1 | | | 107.6 | | | 109.7 | | | 110.2 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 121.4 | HCM Level of Service | F |
| HCM Volume to Capacity ratio | 1.24 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 111.3% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.66 | 1.00 | 1.00 | 0.44 | 1.00 | 1.00 | 0.34 | 1.00 | 1.00 | 0.15 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1228 | 3539 | 1583 | 813 | 1863 | 1583 | 1243 | 3539 | 1583 | 532 | 3539 | 1583 |
| Volume (vph) | 73 | 159 | 163 | 228 | 142 | 169 | 305 | 1106 | 119 | 139 | 544 | 97 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 79 | 173 | 177 | 248 | 154 | 184 | 332 | 1202 | 129 | 151 | 591 | 105 |
| RTOR Reduction (vph) | 0 | 0 | 156 | 0 | 0 | 145 | 0 | 0 | 54 | 0 | 0 | 53 |
| Lane Group Flow (vph) | 79 | 173 | 21 | 248 | 154 | 39 | 332 | 1202 | 75 | 151 | 591 | 52 |
| Turn Type | pm+pt | | Perm | pm+pt | | Perm | pm+pt | | Perm | pm+pt | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Actuated Green, G (s) | 19.2 | 12.6 | 12.6 | 37.5 | 25.4 | 25.4 | 78.7 | 67.0 | 67.0 | 69.3 | 62.3 | 62.3 |
| Effective Green, g (s) | 23.2 | 15.1 | 15.1 | 40.0 | 27.9 | 27.9 | 82.0 | 69.5 | 69.5 | 73.3 | 64.8 | 64.8 |
| Actuated g/C Ratio | 0.18 | 0.12 | 0.12 | 0.31 | 0.21 | 0.21 | 0.63 | 0.53 | 0.53 | 0.56 | 0.50 | 0.50 |
| Clearance Time (s) | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 | 5.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 253 | 411 | 184 | 404 | 400 | 340 | 1006 | 1892 | 846 | 490 | 1764 | 789 |
| v/s Ratio Prot | 0.02 | 0.05 | | c0.10 | 0.08 | | c0.03 | c0.34 | | 0.02 | 0.17 | |
| v/s Ratio Perm | 0.04 | | 0.01 | c0.09 | | 0.02 | 0.17 | | 0.05 | 0.15 | | 0.03 |
| v/c Ratio | 0.31 | 0.42 | 0.11 | 0.61 | 0.38 | 0.12 | 0.33 | 0.64 | 0.09 | 0.31 | 0.34 | 0.07 |
| Uniform Delay, d1 | 45.9 | 53.4 | 51.4 | 36.4 | 43.7 | 41.1 | 10.7 | 21.3 | 14.8 | 15.6 | 19.6 | 16.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.81 | 0.96 | 1.54 | 1.41 | 0.60 | 0.17 |
| Incremental Delay, d2 | 0.7 | 0.7 | 0.3 | 2.8 | 0.6 | 0.2 | 0.1 | 1.1 | 0.1 | 0.2 | 0.3 | 0.1 |
| Delay (s) | 46.6 | 54.1 | 51.7 | 39.2 | 44.3 | 41.3 | 8.9 | 21.5 | 22.9 | 22.3 | 12.1 | 2.9 |
| Level of Service | D | D | D | D | D | D | A | C | C | C | B | A |
| Approach Delay (s) | | 51.7 | | | 41.2 | | | 19.1 | | | 12.8 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 25.2 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 64.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.86 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1521 | 1504 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.12 | 1.00 | 1.00 | 0.67 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 224 | 1863 | 1583 | 1241 | 1521 | 1504 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 38 | 16 | 102 | 325 | 32 | 933 | 96 | 945 | 114 | 140 | 738 | 32 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 41 | 17 | 111 | 353 | 35 | 1014 | 104 | 1027 | 124 | 152 | 802 | 35 |
| RTOR Reduction (vph) | 0 | 0 | 83 | 0 | 112 | 112 | 0 | 0 | 73 | 0 | 0 | 20 |
| Lane Group Flow (vph) | 41 | 17 | 28 | 353 | 430 | 395 | 104 | 1027 | 51 | 152 | 802 | 15 |
| Turn Type | pm+pt | | Perm | pm+pt | | Perm | Prot | | Perm | Prot | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | | | 2 | | | 6 |
| Actuated Green, G (s) | 32.6 | 29.8 | 29.8 | 49.8 | 39.5 | 39.5 | 6.8 | 49.7 | 49.7 | 8.0 | 50.9 | 50.9 |
| Effective Green, g (s) | 39.6 | 33.3 | 33.3 | 53.3 | 43.0 | 43.0 | 10.3 | 53.2 | 53.2 | 11.5 | 54.4 | 54.4 |
| Actuated g/C Ratio | 0.30 | 0.26 | 0.26 | 0.41 | 0.33 | 0.33 | 0.08 | 0.41 | 0.41 | 0.09 | 0.42 | 0.42 |
| Clearance Time (s) | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 143 | 477 | 405 | 574 | 503 | 497 | 272 | 1448 | 648 | 304 | 1481 | 662 |
| v/s Ratio Prot | 0.01 | 0.01 | | c0.08 | c0.28 | | 0.03 | c0.29 | | c0.04 | 0.23 | |
| v/s Ratio Perm | 0.07 | | 0.02 | 0.18 | | 0.26 | | | 0.03 | | | 0.01 |
| v/c Ratio | 0.29 | 0.04 | 0.07 | 0.61 | 0.85 | 0.79 | 0.38 | 0.71 | 0.08 | 0.50 | 0.54 | 0.02 |
| Uniform Delay, d1 | 35.0 | 36.3 | 36.6 | 28.9 | 40.6 | 39.5 | 56.8 | 32.0 | 23.4 | 56.5 | 28.4 | 22.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.40 | 0.43 | 0.35 | 1.20 | 0.77 | 0.64 |
| Incremental Delay, d2 | 1.1 | 0.0 | 0.1 | 2.0 | 13.2 | 8.5 | 0.7 | 2.5 | 0.2 | 1.2 | 1.3 | 0.1 |
| Delay (s) | 36.1 | 36.3 | 36.7 | 30.9 | 53.8 | 48.0 | 80.1 | 16.3 | 8.4 | 68.9 | 23.2 | 14.4 |
| Level of Service | D | D | D | C | D | D | F | B | A | E | C | B |
| Approach Delay (s) | | 36.5 | | | 45.9 | | | 20.8 | | | 29.9 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 33.1 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 78.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | WBL | WBR | NET | NER | SWL | SWT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Volume (vph) | 84 | 186 | 969 | 701 | 369 | 796 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 91 | 202 | 1053 | 762 | 401 | 865 |
| RTOR Reduction (vph) | 0 | 180 | 0 | 214 | 0 | 0 |
| Lane Group Flow (vph) | 91 | 22 | 1053 | 548 | 401 | 865 |
| Turn Type | | Perm | | Perm | Prot | |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | | |
| Actuated Green, G (s) | 11.5 | 11.5 | 65.4 | 65.4 | 33.6 | 105.5 |
| Effective Green, g (s) | 14.0 | 14.0 | 67.9 | 67.9 | 36.1 | 108.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.52 | 0.52 | 0.28 | 0.83 |
| Clearance Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 191 | 170 | 1848 | 827 | 492 | 2940 |
| v/s Ratio Prot | c0.05 | | 0.30 | | c0.23 | 0.24 |
| v/s Ratio Perm | | 0.01 | | c0.35 | | |
| v/c Ratio | 0.48 | 0.13 | 0.57 | 0.66 | 0.82 | 0.29 |
| Uniform Delay, d1 | 54.6 | 52.5 | 21.1 | 22.7 | 43.8 | 2.5 |
| Progression Factor | 0.99 | 0.93 | 0.99 | 1.35 | 0.79 | 2.04 |
| Incremental Delay, d2 | 1.9 | 0.3 | 1.0 | 3.2 | 8.8 | 0.2 |
| Delay (s) | 55.6 | 49.1 | 21.9 | 33.9 | 43.6 | 5.2 |
| Level of Service | E | D | C | C | D | A |
| Approach Delay (s) | 51.1 | | 26.9 | | | 17.4 |
| Approach LOS | D | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 25.4 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 70.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | | 4.0 | 4.0 | | 4.0 | 4.0 |
| Lane Util. Factor | 0.97 | 0.95 | | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 1.00 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.96 | 1.00 | | 0.96 | 1.00 |
| Satd. Flow (prot) | 3433 | 3503 | | 1770 | 3525 | | | 1792 | 1583 | | 1796 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.75 | 1.00 | | 0.76 | 1.00 |
| Satd. Flow (perm) | 3433 | 3503 | | 1770 | 3525 | | | 1405 | 1583 | | 1422 | 1583 |
| Volume (vph) | 461 | 1303 | 96 | 44 | 921 | 25 | 47 | 13 | 22 | 54 | 18 | 425 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 501 | 1416 | 104 | 48 | 1001 | 27 | 51 | 14 | 24 | 59 | 20 | 462 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 0 | 18 | 0 | 0 | 180 |
| Lane Group Flow (vph) | 501 | 1512 | 0 | 48 | 1025 | 0 | 0 | 65 | 6 | 0 | 79 | 282 |
| Turn Type | Prot | | | Prot | | | Perm | | Perm | Perm | | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | 8 | 4 | | 4 |
| Actuated Green, G (s) | 10.9 | 30.6 | | 2.4 | 22.1 | | | 13.5 | 13.5 | | 13.5 | 13.5 |
| Effective Green, g (s) | 12.4 | 33.1 | | 3.9 | 24.6 | | | 16.0 | 16.0 | | 16.0 | 16.0 |
| Actuated g/C Ratio | 0.19 | 0.51 | | 0.06 | 0.38 | | | 0.25 | 0.25 | | 0.25 | 0.25 |
| Clearance Time (s) | 5.5 | 6.5 | | 5.5 | 6.5 | | | 6.5 | 6.5 | | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 655 | 1784 | | 106 | 1334 | | | 346 | 390 | | 350 | 390 |
| v/s Ratio Prot | c0.15 | c0.43 | | 0.03 | 0.29 | | | | | | | |
| v/s Ratio Perm | | | | | | | | 0.05 | 0.00 | | 0.06 | c0.18 |
| v/c Ratio | 0.76 | 0.85 | | 0.45 | 0.77 | | | 0.19 | 0.02 | | 0.23 | 0.72 |
| Uniform Delay, d1 | 24.9 | 13.8 | | 29.5 | 17.7 | | | 19.4 | 18.5 | | 19.6 | 22.5 |
| Progression Factor | 1.00 | 1.00 | | 1.07 | 0.97 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 5.3 | 5.2 | | 3.0 | 4.2 | | | 1.2 | 0.1 | | 1.5 | 11.0 |
| Delay (s) | 30.2 | 19.0 | | 34.4 | 21.4 | | | 20.6 | 18.6 | | 21.0 | 33.5 |
| Level of Service | C | B | | C | C | | | C | B | | C | C |
| Approach Delay (s) | | 21.8 | | | 22.0 | | | 20.0 | | | 31.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 23.2 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 65.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 65.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBR | EBR2 | WBL | WBT | WBR | NBL | NBT | NBR2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | 1770 | 1632 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | | 1770 | 1632 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Volume (vph) | 20 | 29 | 39 | 824 | 44 | 212 | 58 | 494 | 778 | 43 | 333 | 44 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 22 | 32 | 42 | 896 | 48 | 230 | 63 | 537 | 846 | 47 | 362 | 48 |
| RTOR Reduction (vph) | 0 | 38 | 0 | 0 | 122 | 0 | 0 | 0 | 586 | 0 | 0 | 34 |
| Lane Group Flow (vph) | 22 | 36 | 0 | 896 | 156 | 0 | 63 | 537 | 260 | 47 | 362 | 14 |
| Turn Type | Prot | custom | | pm+pt | | | Prot | | Perm | Prot | | Perm |
| Protected Phases | 7 | | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | 4 | | 8 | | | | | 2 | | | 6 |
| Actuated Green, G (s) | 2.1 | 8.7 | | 66.7 | 58.1 | | 8.1 | 37.4 | 37.4 | 6.4 | 35.7 | 35.7 |
| Effective Green, g (s) | 4.6 | 11.2 | | 69.2 | 60.6 | | 10.6 | 39.9 | 39.9 | 8.9 | 38.2 | 38.2 |
| Actuated g/C Ratio | 0.04 | 0.09 | | 0.53 | 0.47 | | 0.08 | 0.31 | 0.31 | 0.07 | 0.29 | 0.29 |
| Clearance Time (s) | 6.5 | 6.5 | | 6.5 | 6.5 | | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 63 | 136 | | 942 | 761 | | 144 | 1086 | 486 | 121 | 1040 | 465 |
| v/s Ratio Prot | 0.01 | | | c0.40 | 0.10 | | c0.04 | 0.15 | | 0.03 | 0.10 | |
| v/s Ratio Perm | | 0.02 | | 0.11 | | | | | c0.16 | | | 0.01 |
| v/c Ratio | 0.35 | 0.26 | | 0.95 | 0.20 | | 0.44 | 0.49 | 0.53 | 0.39 | 0.35 | 0.03 |
| Uniform Delay, d1 | 61.2 | 55.5 | | 28.8 | 20.5 | | 56.9 | 36.8 | 37.3 | 57.9 | 36.1 | 32.7 |
| Progression Factor | 1.00 | 1.00 | | 1.06 | 1.21 | | 1.00 | 1.00 | 1.00 | 0.82 | 1.17 | 2.11 |
| Incremental Delay, d2 | 3.3 | 1.0 | | 18.6 | 0.1 | | 2.1 | 1.6 | 4.2 | 2.0 | 0.9 | 0.1 |
| Delay (s) | 64.6 | 56.6 | | 49.0 | 24.9 | | 59.0 | 38.4 | 41.5 | 49.4 | 43.0 | 69.1 |
| Level of Service | E | E | | D | C | | E | D | D | D | D | E |
| Approach Delay (s) | | | | | 43.3 | | | 41.1 | | | 46.4 | |
| Approach LOS | | | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 43.2 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 80.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group