# Table of Contents

## Section I. Interrupted Flow

<table>
<thead>
<tr>
<th>Module</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1: Streets (Signals)</td>
<td>3</td>
</tr>
<tr>
<td>Module 2: Two Way Stop Control</td>
<td>16</td>
</tr>
<tr>
<td>Module 3: All Way Stop Control</td>
<td>22</td>
</tr>
<tr>
<td>Module 4: Roundabouts</td>
<td>27</td>
</tr>
</tbody>
</table>

## Section II. Uninterrupted Flow

<table>
<thead>
<tr>
<th>Module</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 5: Freeways</td>
<td>31</td>
</tr>
<tr>
<td>Module 6: Weaving</td>
<td>35</td>
</tr>
<tr>
<td>Module 7: Ramps</td>
<td>39</td>
</tr>
<tr>
<td>Module 8: Multilane</td>
<td>43</td>
</tr>
<tr>
<td>Module 9: Two Lane</td>
<td>48</td>
</tr>
</tbody>
</table>
Module 1: Streets

McTrans has provided a video tutorial for the Streets module at mctrans.ce.ufl.edu/hcs

1. Open HCS 2010
2. Select the Streets icon *Streets now handles signals and signalized corridors
3. Complete the Quick Start Screen
   a. Change **forward direction** to NB
   b. Change the **speed limit** to 45

*Forward direction* = this entry typically specifies the direction of "phase 2" in the timing plan, (i.e. the main road). Reversing the [urban street](#) forward direction could cause forward direction segment-specific MOEs (e.g., running speed, travel time) to be reported for the reverse direction, and vice-versa. *you can only change the direction from N to S or from E to W*
4. Enter Information in the **General** Section
   a. Street Name
   b. Intersection
   c. Description
   d. PHF (.92 urban .88 rural)
5. Enter **Lane Configuration**

   a. Click  
   to enlarge the Quick Lanes window
   b. Remove the right turn arrow from the EB and WB approaches  
     *To remove a lane from an approach click the white arrow*
   c. Add a thru/right shared arrow for the EB and WB approaches  
     *To add a lane to an approach click the black/grey buttons*
   d. Close the window to return to the main screen
6. Enter **Traffic** Data
   a. Demand (Traffic Volumes)
   b. Storage Length (for turn lanes)
   c. Percent Heavy Vehicles
   d. Grade
   e. Speed limit (may need adjusting if side roads have a different speed limit than mainline)
7. Enter **Phasing** data

   a. Click to enlarge the **Quick Phases** window
   
   b. Click each phase box to toggle between allowable movements to reflect the phasing plan below.
8. Enter **Timing** (This is new in 2010)
   a. Enter times for each Phase Split

   *Notice that the familiar screen from HCS 2000 can be seen above the new Timing window*
9. Enter the **General** Data
   a. Analyst
   b. Agency
   c. Time Period (year & time)
   d. Jurisdiction (county)
   e. Queue Length Percentile
      (change to 95)
10. Run **Full Optimization**

   a. Click the **Run** icon
   b. Check Cycle Length
   c. Check Phasing Sequence
   d. Change **Minimum Cycle** to 60
   e. Change **Maximum Cycle** to 120
   f. Change **Number of Generation** to 200
   g. Change **Mutation Probability** to 4
11. **Optimization** Results
   a. Shows the original and optimum delay results
      *Note be sure to check the Diagnostic Messages*
   b. Click Save to import the optimization results
12. The **Phasing** and **Timing** will have updated

*Note that the Phasing Sequence has changed—An additional phase was added to provide additional time for the eastbound left turn movement.*
13. View/Print **Results** Summary Report

a. Focus on the Movement Group Results

### HCS 2010 Signalized Intersection Results Summary

<table>
<thead>
<tr>
<th>General Information</th>
<th>Intersection Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency: ODOT</td>
<td>Location: Dayton County</td>
</tr>
<tr>
<td>Analyst: Design Engineer</td>
<td>Time Period: 2012 PM</td>
</tr>
<tr>
<td>Jurisdiction: Dayton County</td>
<td>Phase: 0</td>
</tr>
<tr>
<td>Intersection: 2010</td>
<td>Analyst Period: 1X 700</td>
</tr>
<tr>
<td>File Name: not applicable.txt</td>
<td>Project Description: Existing Geometry Design Year Traffic</td>
</tr>
</tbody>
</table>

### Demand Information

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>T</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

### Signal Information

- **Cycle (s):** 110.0 (Reference Phase: 2)
- **Offset:** 0 (Reference Point: End)
- **Uncontrolled:** No (Sim Exit Only On-Off Ramp)
- **Phase Mode:** Full (Sim Exit Only On-Off Ramp)

### Timer Results

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBP</td>
<td>EBP</td>
<td>EBP</td>
<td>EBP</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>3</td>
<td>8</td>
</tr>
</tbody>
</table>

### Movement Group Results

#### Approach Movement

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>T</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>

| Adjusted Flow Rate (v), veh/h | Adjusted Saturation Flow Rate (q), veh/hl
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Queue Service Time (q), s</th>
<th>Cycle Queue Clearance Time (q), s</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capacity (c), veh/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>412</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Volume-to-Capacity Ratio (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.624</td>
</tr>
</tbody>
</table>

### Intersection Delays

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

### Approach Delays, s/veh / LOS

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>139.1</td>
<td>146.3</td>
<td>146.2</td>
<td>228.6</td>
</tr>
</tbody>
</table>

### Intersection Delays, s/veh / LOS

<table>
<thead>
<tr>
<th>EB</th>
<th>WS</th>
<th>NB</th>
<th>SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>169.1</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>
14. View Messages Report
   Look for any warnings!!!

--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---
Module 2: Two Way Stop Control

1. Open HCS 2010
2. Select the TWSC module

3. Create a new file. Select TWSC on the Analysis Type screen.
4. Complete the **General Information** section.

5. Select **Quick Entry** under **Lane Designation, Vehicle Volumes and Adjustments**
6. Enter the lane configuration into the **Quick Entry** window. (click the black arrow buttons to add movement. Click the white arrows to remove a movement). Click **Save**.
7. Complete the **Lane Designation, Vehicle Volumes and Adjustments** Section
   a. Select a **Major Street Direction** (the free flowing direction)
   b. Notice that the **Number of Lanes and Usage** is filled in from the Quick Entry
   c. If applicable, designate **channelized right turns** for each approach (*This button is activated only when the right-turning traffic from the major road is separated by a triangular island and has to comply with a stop or yield sign.*)
   d. Select **Flared Minor Street Approach and Storage** (The number of spaces for right-turning passenger cars that can queue at the stop line without obstructing the access to the stop line for other movements). **NOTE:** for use when there is room for sneaker right turners to squeeze through at an approach.
   e. Select a **Median Type** for the Major approach (Undivided, Raised Curb or TWLTL) If type is Raised Curb or TWLTL then input the storage (for two stage left turns from the minor street)
8. Continue to complete the **Lane Designation, Vehicle Volumes and Adjustments**
   a. Enter the **Volume** for each movement
   b. Enter the **Peak Hour Factor** for each movement
   c. Enter the **Percent Heavy Vehicle** for each movement
   d. Enter the **Percent Grade** for each approach

| L | TR | LT | R | Volume (vph), Increment | [ | [ | [ | [ | [ | [ | [ | [ | [ | [ | [ |
|---|----|----|---|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30| 50 | 25 | 25 | 70 | 50 | 80 | 250 | 100 | 100 | 250 | 75 |
| Peak Hour Factor, PEF |
| 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Peak 15 Minute Volume (v) |
| 8 | 14 | 7 | 7 | 13 | 14 | 22 | 68 | 27 | 27 | 68 | 20 |
| Percent Heavy Vehicles (%) |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Percent Grads (%) |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Hourly Flow Rates (vph) |
| 32 | 54 | 27 | 27 | 76 | 54 | 86 | 271 | 100 | 100 | 271 | 81 |
| Saturation Flow Rate (vph) |

Percent Thru Using Shared Lane (%)
9. Scroll down to review the **Results** (results are calculated for every movement and approach)

<table>
<thead>
<tr>
<th></th>
<th>Minor Street</th>
<th>Major Street</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eastbound</td>
<td>Northbound</td>
</tr>
<tr>
<td>Left</td>
<td>Left</td>
<td>Left</td>
</tr>
<tr>
<td>Thru</td>
<td>Thru</td>
<td>Thru</td>
</tr>
<tr>
<td>Right</td>
<td>Right</td>
<td>Right</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>Southbound</td>
</tr>
<tr>
<td>Left</td>
<td>Left</td>
<td>Left</td>
</tr>
<tr>
<td>Thru</td>
<td>Thru</td>
<td>Thru</td>
</tr>
<tr>
<td>Right</td>
<td>Right</td>
<td>Right</td>
</tr>
</tbody>
</table>

- **Volume (vph)**
  - Eastbound: 32, 61, 103, 54
  - Northbound: 86, 108

- **Movement Capacity**
  - Eastbound: 105, 220, 201, 777
  - Northbound: 1301, 1174

- **Shared Lane Capacity**
  - Eastbound: 220, 201
  - Northbound: 220, 201

- **Movement wtd Ratio**
  - Eastbound: 0.30, 0.37, 0.51, 0.07
  - Northbound: 0.07, 0.09

- **95th Queue Length**
  - Eastbound: 1.17, 1.80, 2.60, 0.22
  - Northbound: 0.23, 0.30

- **Control Delay [sec/veh]**
  - Eastbound: 53.7, 30.6, 40.3, 10.0
  - Northbound: 82, 8.4

- **Movement Level of Service**
  - Eastbound: F, D, E
  - Northbound: A, A

- **Approach Delay [sec/veh]**
  - Eastbound: 37.1, 29.8
  - Northbound: 29.8

- **Approach Level of Service**
  - Eastbound: E
  - Northbound: D

10. Select **Two Way Stop Control Summary** from the **Report Quick Jump** to view (or print) the results
M O D U L E 3: A L L W A Y S T O P C O N T R O L

1. Open HCS 2010
2. Select the AWSC module

3. Create a new file. Select AWSC on the Analysis Type screen.
4. Complete the **General Information** section.

5. Select **Quick Entry** under **Lane Designation, Vehicle Volumes and Adjustments**
6. Enter the lane configuration into the **Quick Entry** window. (click the black arrow buttons to add movement. Click the white arrows to remove a movement). Click **Save**.
7. Complete the **Lane Designation, Vehicle Volumes and Adjustments** Section
   a. Notice that the **Number of Lanes and Usage** is filled in from the Quick Entry
   b. Enter the **Volume** for each movement
   c. If applicable, enter the **Percent Thrus using Left Lane** for each leg
   d. Enter the **Peak Hour Factor** for each movement
   e. Enter the **Percent Heavy Vehicle** for each movement
8. Scroll down to review the **Results**

![Results Table]

9. Select **Two Way Stop Control Summary** from the **AWSC Report Quick Jump** to view (or print) the results

![Quick Jump Selection]

![Detailed Results Table]
**Module 4: Roundabouts**

1. Open HCS 2010
2. Select the Roundabout module
3. Open a New File
4. Enter the General Information

<table>
<thead>
<tr>
<th><strong>Table: General Information</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analyst</strong></td>
</tr>
<tr>
<td><strong>Agency/Co.</strong></td>
</tr>
<tr>
<td><strong>Date</strong></td>
</tr>
<tr>
<td><strong>Time Period Analyzed</strong></td>
</tr>
<tr>
<td><strong>East/West Street Name</strong></td>
</tr>
<tr>
<td><strong>Project ID</strong></td>
</tr>
<tr>
<td><strong>Intersection</strong></td>
</tr>
<tr>
<td><strong>Jurisdiction</strong></td>
</tr>
<tr>
<td><strong>Units: U. S. Customary</strong></td>
</tr>
<tr>
<td><strong>Analysis Year</strong></td>
</tr>
<tr>
<td><strong>North/South Street Name</strong></td>
</tr>
</tbody>
</table>
5. Complete the **Lane Designations** section
   a. Enter the lane configuration for each approach
      
      *For a one-lane roundabout entry, enter one thru lane and select both the left "shared" button and the right "shared" button. For a two-lane roundabout entry, enter one of the following combinations based on the entry lanes' pavement markings: 1) two thru lanes and select both "shared" buttons, one left lane and one thru lane and select the right "shared" button, or 2) one thru lane and one left lane and select the left "shared" button.*
   
   b. If a multilane enter the **Percent of Entry Vehicles using Left Lane**
   c. Enter the number of **Conflicting Lanes on Entry**
      *The number of lanes that pass directly in front of the approach entry.*
   d. If applicable, designate a **Right Turn Bypass Lane**
      
      i. **Yielding** - right-turning traffic yields to exiting roundabout traffic
      ii. **Non-Yielding** - right-turning traffic enters a new lane on exit leg
      
      *For roundabout entries with right turn bypass lanes, the user should enter one thru lane, select both the left "shared" button and the right "shared button", and select the type of bypass lane in the "Right-Turn Bypass" field.*
   
   e. If applicable, designate the number of **Conflicting Lanes on Bypass Entry**
      *The number of lanes that pass directly in front of the yielding bypass lane.*

---

*This is an example of a single lane RAB with a right bypass lane on the South Leg*
6. Complete the **Vehicle Volumes** section
   a. Enter Vehicle Volumes for each approach movement
   b. Enter Peak Hour Factor
   c. Enter Percent Heavy Vehicles

7. Scroll down to review the **Results**
8. Print the Report
   a. Go to the **Reports** Menu and select **Formatted Report**
   b. View in bottom of split screen
   c. Go to File > Print to print
Module 5: Freeway

1. Open HCS 2010
2. Select the Freeways module
3. Open a New File and select Operations for Analysis Type
4. Enter the **General Information**

5. Complete the **Flow Rate** and **Free Flow Speed** Section
   a. Volume
   b. Peak Hour Factor
   c. Number of Lanes
   d. Terrain (Level, Rolling, Mountainous, Grade or Composite)
      i. Level, Rolling and Mountainous - defined in HCM see pg 11-14
      ii. Grade - allows the entrance of a specific grade and length
      iii. Composite - produces a dialog list to enter grades for several lengths
   e. Truck Percentage
   f. RV Percentage
   g. Driver populations adjustment
      *the Driver Population Factor is normally 1.00, unless the population is dominated by unfamiliar users in which case a value from 0.85-1.00 may be used.*
6. Complete the **Free Flow Speed** Section
   a. Enter the Lane width
   b. Enter the Right-side lateral clearance
   c. Enter Total ramp Density the number of ramps within 3 miles in each direction on one side of the freeway divided by six

![Free Flow Speed Section]

7. Scroll down to view the **Results**

![Results Table]

<table>
<thead>
<tr>
<th>Flow rate, vp</th>
<th>3160 pc/h/ln</th>
<th>Free-flow speed</th>
<th>73.6 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lanes, N</td>
<td>2</td>
<td>Speed, S</td>
<td>23.4 mph</td>
</tr>
<tr>
<td>Level of service, LOS</td>
<td>F</td>
<td>Density, D</td>
<td>135.3 pc/mi/ln</td>
</tr>
</tbody>
</table>
8. Go to the **Reports** menu then **Basic Freeway Worksheet** to print the report.

![Basic Freeway Worksheet](image)

**General Information**
- Analyst
- Agency or Company
- Date Performed: 9/5/2012
- Analysis Time Period
- Project Description

**Site Information**
- Highway/Direction of Travel
- From/To
- Jurisdiction
- Analysis Year

**Flow Inputs**
- Volume, V: 4515 veh/h
- AADT: 94515 veh/day
- Peak-Hour Factor, PHF: 0.80
- %Trucks and Buses, P_t: 24
- %RVs, P_r: 0
- Peak-Hr Direction Prop, D: 0
- DDHV = AADT x K x D: veh/h

**Calculate Flow Adjustments**
- E_r: 1.2
- E_t: 1.5
- t_{HV} = \frac{1}{(1+E_r)(1+E_t)} = \frac{1}{12} = 0.083

**Speed Inputs**
- Lane Width: 12.0 ft
- Rt-Side Lst. Clearance: 6.0 ft
- Number of Lanes, N: 2
- Total Ramp Density, TRD: 0.50 ramps/mi
- FFS (measured): 75.4 mph

**Calc Speed Adj and FFS**
- \text{FFS}_{\text{measured}}: 75.4 mph
- \text{FFS}_{\text{measured}}: 75.4 mph
- TRD Adjustment: 18 mph

**LOS and Performance Measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v_p</td>
<td>\frac{(V + DDHV)}{(PHF \times N \times t_{HV} \times f_{g})}</td>
</tr>
<tr>
<td>f_{HV}</td>
<td>3160 pc/h/ln</td>
</tr>
<tr>
<td>f_{g}</td>
<td>23.4 mph</td>
</tr>
<tr>
<td>S</td>
<td>135.3 pc/mi/ln</td>
</tr>
</tbody>
</table>

**Design (N)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v_p</td>
<td>\frac{(V + DDHV)}{(PHF \times N \times S)}</td>
</tr>
<tr>
<td>f_{HV}</td>
<td>3160 pc/h/ln</td>
</tr>
<tr>
<td>f_{g}</td>
<td>23.4 mph</td>
</tr>
<tr>
<td>S</td>
<td>135.3 pc/mi/ln</td>
</tr>
</tbody>
</table>

Required Number of Lanes, N
Module 6: Weaving

1. Open HCS 2010
2. Select the Weaving module
3. Open a New File an select USC for Unit Type
4. Enter the General Information

5. Complete the **Roadway Conditions** section
   a. **Weaving configuration**
      i. One sided – no weaving maneuver requires more than two lane changes
      ii. Two-sided – at least one weaving maneuver requires three or more lane changes or were a single lane on ramp is followed closely by a single lane off ramp on the opposite side of the freeway.
6. Complete the **Volume** section

```
<table>
<thead>
<tr>
<th>Volume Components</th>
<th>Non-Weaving Volumes</th>
<th>Weaving Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( V_{FF} )</td>
<td>( V_{RR} )</td>
</tr>
<tr>
<td></td>
<td>( V_{RF} )</td>
<td>( V_{FR} )</td>
</tr>
<tr>
<td>Volume</td>
<td>1650 veh/h</td>
<td>720 veh/h</td>
</tr>
<tr>
<td>PHF</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td>15 minute volume, ( V_{15} )</td>
<td>450 veh</td>
<td>135 veh</td>
</tr>
<tr>
<td></td>
<td>135 veh/h</td>
<td>200 veh/h</td>
</tr>
</tbody>
</table>
```

7. Completed the **Vehicle Composition and Adjustment** section

*the Driver Population Factor is normally 1.00, unless the population is dominated by unfamiliar users in which case a value from 0.85-1.00 may be used.*
8. Complete the **Configuration Characteristics** section
   a. **Number of Maneuver Lanes** – the number of lanes from which a weaving maneuver may be made with one or no lane changes
   b. **Interchange Density** - average number of interchanges per mile from a distance 3 miles upstream to 3 miles downstream of the midpoint of the weaving segment. The subject weaving segment should be counted as one interchange.
   c. **Minimum RF Lane changes** – minimum number of lane changes that must be made by a single weaving vehicle moving from the on-ramp to the freeway
   d. **Minimum FR Lane changes** – minimum number of lane changes that must be made by a single weaving vehicle moving from the freeway to the off-ramp
   e. **Minimum RR Lane changes** – minimum number of lane changes that must be made by a single weaving vehicle moving from ramp to ramp.*two sided only

![Configuration Characteristics Table]

9. **View the Results**

![Results Table]

10. Go to the **Reports** menu and select **Freeway Weaving Worksheet** to view and print report
Module 7: RAMPS

1. Open HCS 2010
2. Select the **Ramps** module

3. Open a **New File** and select **Merge** (On/Entering Ramp) or **Diverge** (Off/Exiting Ramp) Junction type
4. Complete the General Information Section

5. Complete the Freeway Data and Off Ramp Data of the Freeway-Ramp Components and Characteristics
   a. Enter the number of freeway lanes, freeway free flow speed, and freeway volume.
   b. Select the side of the freeway the ramp is located
   c. Enter the free flow ramp speed, the ramp volume, the number of lanes on the ramp and the length of the deceleration lane
6. If there is an adjacent ramp within 8,000 ft of the analysis ramp, the complete the **Adjacent Ramp Data** section. *If both upstream and downstream adjacent ramps exist, the analysis must be run twice.*

![Adjacent Ramp Data](image)

7. Complete the **Volume Adjustment** section
   a. Enter the Peak Hour Factor
   b. Select the Terrain Type
   c. Enter the Truck Percentage
   d. Enter the Driver Populations Adjustment factor

![Volume Adjustment](image)
8. View the Results

![HCS 2010 Ramps - [Ramps1 *]](image)

**RESULTS of DIVERGE AREA**

- Estimation of \( V_{12} \)
  - \( P = 1.000 \) Using Equ. Spec
  - \( V_{12} = \frac{\sqrt{R}}{\sqrt{F - R}} \) PFD = 3333 pcph

**Capacity Checks:**

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Maximum</th>
<th>Violation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{12} )</td>
<td>3333</td>
<td>4400</td>
<td>No</td>
</tr>
<tr>
<td>( V_{RF} )</td>
<td>2222</td>
<td>4500</td>
<td>No</td>
</tr>
<tr>
<td>( V_{R} )</td>
<td>1111</td>
<td>2000</td>
<td>No</td>
</tr>
</tbody>
</table>

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

- Compute OR = 26.4 pcph
- Compute SR = 48.1 mph
- LOS = D (Exhibit 13-2)

9. Go to the **Reports Menu.** Select **Ramps and Ramp Junctions Worksheet** and Print the report.

![HCS 2010 Ramps and Ramp Junctions Worksheet](image)
1. Open HCS 2010
2. Select the Multilane module

3. Open a New File and select Operations Analysis Type
4. Enter the General information

![Image of the Multilane Highway's Operational Analysis window]

- Analyst: YOU
- Highway: US 41
- Agency/Co: GDOT
- From/To: A to B
- Date: 5/11/2012
- Units: U.S. Customary
- Jurisdiction: Cherokee
- Analysis Time Period: 2040 AM
- Analysis Year: 2012
- Project Description: PI 1234567
5. Complete the **Free Flow Speed** Section
   a. Select Base FFS for the Free Flow Speed
   b. Select the Median Type
   c. Enter the Lane Width
   d. Enter the Lateral Clearance for the right and left side
   e. Enter the Access points/mile
6. Complete the **Volume** section
   a. Enter the **Volume** for both directions
   b. Enter the **Peak Hour Factor**
   c. Enter the **Number of Lanes**
   d. Select the **Terrain** type
   e. Enter the **Truck Percentage**
   f. Enter the **Driver Populations Factor**
7. View the **results**.

8. Go to the **Reports** menu to select the Multilane Worksheet for both directions and print.
Module 7: TwoLane

1. Open HCS 2010
2. Select the TwoLane module
3. Open a New File and confirm Unit Type
4. Enter General Information

![Image of HCS 2010 Two Lane - [TwoLane1] window with General Information form]

General Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyst</td>
<td></td>
</tr>
<tr>
<td>Agency/Co.</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>9/11/2012</td>
</tr>
<tr>
<td>Analysis Time Period</td>
<td></td>
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<tr>
<td>Project Description</td>
<td></td>
</tr>
<tr>
<td>Highway</td>
<td></td>
</tr>
<tr>
<td>From/To</td>
<td></td>
</tr>
<tr>
<td>Units: U. S. Customary</td>
<td></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td></td>
</tr>
<tr>
<td>Analysis Year</td>
<td></td>
</tr>
</tbody>
</table>
5. Complete the **Input Data** Section - Analyze one direction at a time
   a. Select a Terrain type
   b. Enter the shoulder width, lane width and segment length of the area to be analyzed
   c. Select the Class of highway see page 15-3 of HCM 2010
   d. Enter the volumes for the analysis direction and the opposing direction
   e. Enter the peak hour factor keep .88 if unknown
   f. Enter Truck Percentage
   g. Enter the Percent No-Passing Zone is entered based on Exhibit 15-5 HCM2010
   h. Enter the Access-Point Density divide the total number of unsignalized intersections and driveways on both sides of the roadway segment by the length of the segment
6. The **Average Travel Speed** section is calculated by HCS

7. Complete the **Free-Flow Speed** Section
   a. Select Estimated
   b. Enter the Base Free Flow speed
   *Note: all the adjustments are calculated by HCS*

![Free-Flow Speed Section]

8. The **Percent Time Spent Following** section is calculated by HCS

9. View the Results

![View Results]

10. Select either the **Directional** and **Directional Passing Lane** report to print.