Chapter 11

Intersection Studies
• Identification of crashes at intersections based on the specified county, dates, Y-line, and intersecting route combinations

• All route combinations must be entered

• All intersection studies are combination dependant

• Milepost information is not necessary to identify crashes at intersections
**General Intersection Studies:**

- Date range = 5 years
- Y-line = 150 feet

**Fatal Intersection Studies:**

- Date range = 5 years
- Y-line = 150 feet

(allows for broader information - especially on rural roads)

**Pedestrian and/or Bicycle Intersection Studies:**

- Date range = 10 years
- Y-line = 50 feet

(smaller subset of data; captures parallel crosswalk areas)

(can compare to HSIP safety warrants)
Highway Safety Improvement Program (HSIP) Intersection Studies:

Date range = 5 years

Y-line = 150 feet

(allows for a comparison with safety warrants)
The following reported crashes would be included in a study of US 1/Capital Blvd and NC 98 (150 foot Y-Line):

<table>
<thead>
<tr>
<th>ON RD</th>
<th>FROM RD</th>
<th>FROM DIST</th>
<th>FROM DIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Blvd</td>
<td>NC 98</td>
<td>0 ft</td>
<td></td>
</tr>
<tr>
<td>NC 98</td>
<td>US 1</td>
<td>10 ft</td>
<td>S</td>
</tr>
<tr>
<td>US 1</td>
<td>NC 98</td>
<td>150 ft</td>
<td>E</td>
</tr>
</tbody>
</table>
Intersection Identification

• Crashes at intersection locations are identified by route **COMBINATIONS** (not mileposts)!

• When performing an intersection study, it is necessary to determine all possible combinations of intersecting routes (therefore, it is important to know all of the possible names of routes).

• It is imperative to list every possible combination (no matter how unlikely).
• Get the mileposting for your intersecting routes (and all coinciding routes).

• Crashes are identified by route combinations

• Beware of loop locations – these group crashes under one intersection and it is the responsibility of the analyst to separate the crashes and identify which loop location each crash occurred at.
Intersection Combination Example

COMBINATIONS

1. 20000015 - 40001287
2. 20000015 - 30000086
3. 20000015 - 50018682
4. 20000015 - 30000043
5. 20000015 - 50003381
6. 40001287 - 30000086
7. 40001287 - 50018682
8. 40001287 - 30000043
9. 40001287 - 50003381
10. 30000086 - 30000043
11. 30000086 - 50003381
12. 50018682 - 30000043
13. 50018682 - 50003381
Intersection Combination Exercise

US 401 (20000401)

Old Wake Forest Rd (50009210)

US 1 (20000001)
Capital Blvd (50004906)

COMBINATIONS
Intersection Combination Exercise

US 401 (20000401)

Old Wake Forest Rd (50009210)

US 1 (20000001)
Capital Blvd (50004906)

**COMBINATIONS**

1. 20000401 - 20000001
2. 20000401 - 50004906
3. 20000401 - 50009210
4. 20000001 - 50009210
5. 50004906 - 50009210
Intersection Study Screen

• Access the “Intersection Analysis Report” screen by selecting the following:

  ➞ Intersection Study Report

• Consists of 3 tabs within the screen:
  
  – **Study Information** - allows for entry of general study information
  
  – **Road Identification** - allows the User to specify the road combinations
  
  – **Accident Adjustments** - allows the User to include or exclude crashes
Study Information Tab

See Chapter 10 for information on this screen.
Enter the “main” route and all coinciding routes and click the “Validate Codes/Names” button.

Road “A” name
Road “A” 8-digit code
Road “B” name
Road “B” 8-digit code

Remember - use caution when using the “Lookup” button!
1. At least one road combination must be specified!

2. To enter a combination of “A” and “B”...
   - For road “A”, enter a road name of up to 25 alphanumeric characters OR enter a valid 8-digit code.
   - For road “B”, enter a road name of up to 25 alphanumeric characters OR enter a valid 8-digit code.
   - Click the **Submit** button
   - Repeat this process to input additional combinations

3. Click the **Validate Codes/Names** button to determine the 8-digit codes for entries with only road names
Road Combinations (Cont.)

- **To delete a combination:**
  - Highlight the row
  - Click the “Delete” key

- **To modify a combination:**
  - Highlight the row
  - Click the “Enter” key
  - Edit record in the input section
  - Click the “Submit” button

- **To identify local names for secondary roads:**
  - Click the “Lookup” button
  - Highlight the name of the roads you want to include
  - Click the “Include” button
  - Modify rows from included local names to show intersecting routes

Remember - use caution when using the “Lookup” button!
Intersection Road Combinations

"Main" route and all coinciding routes

Combinations
• Click on the “Generate Study” button to run an intersection study based on the study criteria.

• A dialog box will prompt users to save a “Crash ID List” (crash level information) or a “Detailed Crash ID List” (person level information) or a “Collision Diagram Data File” (crash level information for a collision diagram). Select the output option (if desired) and click the “OK” button. If selected, this information will be saved as a text file.
• This text file contains 5 columns of crash-level crash data.
• It may be imported into Excel or Access for further review.

<table>
<thead>
<tr>
<th>CRASH ID</th>
<th>ON RD CD</th>
<th>SVRTY</th>
<th>DATE</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>100541110</td>
<td>40001137</td>
<td>5</td>
<td>01/20/2002</td>
<td>19:30</td>
</tr>
<tr>
<td>100992552</td>
<td>40001137</td>
<td>5</td>
<td>09/16/2003</td>
<td>10:15</td>
</tr>
<tr>
<td>101518105</td>
<td>40001137</td>
<td>3</td>
<td>07/14/2005</td>
<td>19:20</td>
</tr>
<tr>
<td>101397384</td>
<td>40001137</td>
<td>5</td>
<td>01/29/2005</td>
<td>10:00</td>
</tr>
<tr>
<td>100871684</td>
<td>40001137</td>
<td>5</td>
<td>04/12/2003</td>
<td>00:45</td>
</tr>
<tr>
<td>101093157</td>
<td>40001137</td>
<td>2</td>
<td>01/15/2004</td>
<td>15:10</td>
</tr>
<tr>
<td>100805434</td>
<td>40001137</td>
<td>6</td>
<td>01/14/2003</td>
<td>19:30</td>
</tr>
<tr>
<td>100806777</td>
<td>40001137</td>
<td>5</td>
<td>01/16/2003</td>
<td>08:09</td>
</tr>
<tr>
<td>100517761</td>
<td>40001137</td>
<td>4</td>
<td>12/19/2001</td>
<td>07:50</td>
</tr>
<tr>
<td>101188041</td>
<td>40001137</td>
<td>5</td>
<td>05/15/2004</td>
<td>02:30</td>
</tr>
<tr>
<td>101447575</td>
<td>40001137</td>
<td>5</td>
<td>04/04/2005</td>
<td>05:50</td>
</tr>
<tr>
<td>100893850</td>
<td>40001137</td>
<td>3</td>
<td>05/11/2003</td>
<td>00:55</td>
</tr>
<tr>
<td>101571846</td>
<td>40001137</td>
<td>2</td>
<td>09/29/2005</td>
<td>18:25</td>
</tr>
</tbody>
</table>
This text file contains 43 columns of person-level crash data.

It may be imported into Excel or Access for further review.
Collision Diagram Data File

- This text file contains 22 columns of crash-level data.
- It may be imported into the semi-automated collision diagram program for development of a collision diagram.
Accident Adjustments Tab

• Allows users to edit (add or delete) crashes.
• Click the “Generate Lists” button to populate the data.
**Included Accidents**

**Crashes added to the study by:**

1) Including crashes from the “Fiche Minus Study Accidents” table

2) Entering a Crash ID into the “Table Input” section and clicking the “Submit” button

3) Clicking the “Import List” button to import a text file containing Crash IDs

4) TEAAS will check all added crashes to ensure they are within the date range of the study.

**To remove crashes from this table:**

Highlight the Crash ID and click the “Delete” key (multiple records may be highlighted using the “Ctrl” or “Shift” keys)
Crashes appearing in this table are contained within the fiche report but have not been included in the study.

To include crashes from this table into study:
- Highlight the Crash ID
- Click the “Include” button
- Highlight multiple records using the “Ctrl” or “Shift” keys.
Crashes appearing in this table are in the study but may or may not be on the fiche report.

To exclude crashes from the study:
- Highlight the Crash ID and click the “Exclude” button
- Highlight multiple records with the “Ctrl” or “Shift” keys

(Excluded crashes are moved to the “Excluded Accidents” table.)
Excluded Accidents

- Can only be populated by excluding crashes from the “Study Accidents List” table

To delete crashes from this panel
  - Highlight the Crash ID
  - Click the “Delete” key
  - Highlight multiple records using the “Ctrl” or “Shift” keys
Intersection Studies - Steps

1) Determine the location and reason for the study
   • Review maps
   • Run feature report(s)
   • Determine all Intersection Combinations
   • Determine or calculate traffic volumes (AADTs)

2) Enter study criteria

3) Generate a fiche report

4) Generate the initial study

5) Evaluate the fiche report and compare it with the initial study to determine if any crashes need to be added or deleted

6) Add or delete crashes on the study in the “Accident Adjustments” tab

7) Generate the final study
Suppose you perform an intersection study on the intersection of US 64 at NC 32 in Washington County from 1/1/1996 through 12/31/1999 with a Y-Line of 150 feet.

Step A - Review maps (county, city, traffic volumes, etc.)
Step B - Run features report(s)

Hint: after reviewing maps and other information it was determined that the northern leg of the US 64/NC 32 intersection is SR 1357 (Washington Street). Therefore, these two additional roads must be considered when the intersection combinations are developed.
Step C - Determine the intersection combinations

- US 64 - WASHINGTON
- US 64 - SR 1357
- US 64 - NC 32
- NC 32 - WASHINGTON
- NC 32 - SR 1357

Step D - Calculate the AADT

\[
\begin{align*}
16,200 &+ 2,700 + 17,500 + 6,100 \\
\hline
42,500 \\
\end{align*}
\]

\[
\frac{42,500}{2} = 21,250 \approx 21,300
\]
Step E - Click on the "New" icon
Step F - Enter known study information
Step G - Go to the "Road Identification" tab
Step H - Enter the fiche roads

(All the roads that you want to look for crashes on)

Step I - Generate and save the fiche report
Step J - Enter all the road combinations
Step K - Generate the initial study
Step L - Save the list of Crash IDs or the data file (optional)
Step M - Save or print the initial study
Step N - Save your study
Step O - Compare the initial study with the fiche report to identify any crashes that need to be added or deleted. Individual crashes may need to be reviewed to make a more accurate decision.

<table>
<thead>
<tr>
<th>Crashes to be added</th>
<th>Crashes to be deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>97068719</td>
<td>96095531</td>
</tr>
<tr>
<td>99106308</td>
<td>98044473</td>
</tr>
<tr>
<td></td>
<td>98122774</td>
</tr>
<tr>
<td></td>
<td>98244134</td>
</tr>
<tr>
<td></td>
<td>99024746</td>
</tr>
<tr>
<td></td>
<td>99113754</td>
</tr>
</tbody>
</table>

Note - this step may actually take a considerable amount of time depending on the number of identified crashes. For training purposes, only the results of this step are shown.
Intersection Study Example (Cont.)

Step P - Click on the “Modify” icon

Step Q - Go to the “Accident Adjustments” tab
Step R - Click the “Generate Lists” button
Step S - Highlight the crashes to be added in the “Fiche Minus Study Accidents List” then click the “Include” button
Step T - Highlight the crashes to be deleted in the “Study Accidents List” then click the “Exclude” button
Step U - Click the “Generate Study” button to run the final study