Chapter 4: Flagger Program

4.1 Introduction

The purpose of the Flagger Program is to calculate an estimated daily user cost (an estimation of the inconvenience in dollars) to the road users that are impacted by a flagging operation on a two-lane, two-way roadway. The daily flagging costs are derived from the relationship between the hourly traffic volumes, length of lane closure, and the time that traffic is stopped. The costs that this program calculates are a part of the Usercost Package, which assists the Contract Time Engineer in determining the liquidated damages to place on the project.

4.2 Process

Step 1: Open the Flagger Program

Step 2: If there is any data already shown in the program you may select the "Clear Worksheet" button on the right side of the program to clear the data from the program.

Step 3: Input the TIP No. and the description in the appropriate boxes.

Guidance: The description should provide the road name and specific construction operation involved.

Step 4: In the Project No. box, input the WBS #

Guidance: The WBS # can be found on the Roadway Title Sheet.

Step 5: In the Project County box, input the county the project is located in.

Step 6: In the Percent Trucks box, input the truck percentage

Guidance: the % trucks for the –L– line may be found on the Roadway Title Sheet.

Step 7: In the Critical Lane Width (ft) box, input the lane width for 1 direction of traffic.

Guidance: The Critical Lane Width is the width of the open lane at the narrowest point between the two ends of the flagging operation. The width of the roadway can be found on the roadway plan sheets, usually labeled on the road.

Step 8: In the Grade % box, input the average grade of the road that will be flagged.

Guidance: The Roadway profile sheets show the grades of the road.

Step 9: In the Approaching Velocity (mph) box, input the existing speed limit for the road before the flagging operation is installed.

Guidance: The existing speed limit for the –L– line road maybe be determined from the Roadway Title Sheet by subtracting 5 mph from the Design Speed indicated (applies for most cases). Other sources to determine the existing speed limit may include the Planning Documents, Google Maps (ground view),and through NCDOT GIS Unit resources (SDV Online).

Step 10: In the Work Zone Velocity (mph) box, input the anticipated work zone velocity.

Guidance: Due to elements of the work zone, including the flagging operation, vehicle speeds will most likely be slower. The typical speed to input is 10 mph to 20 mph less than the existing speed limit.

Step 11: In the Distance between Flaggers (ft) box, input the estimated distance between the two flaggers.

Guidance: The typical distance to input is either 500 ft or 1000 ft.

Step 12: In the Max. Flagging Time (min) box, input the estimate time that a flagger will hold traffic in one direction.

Guidance: The typical time to input is 5 minutes. Note: Flagging operations should not hold traffic for more than 15 minutes.

Step 13: In the Hourly Volume boxes, input the hourly volumes for both directions combined.

Guidance: Method 1 – If hourly traffic counts are available, input the hourly volumes. Method 2 – If no hourly volumes are available, select the "Convert ADT to Hourly Volumes" button, and input the Average Daily Traffic (ADT) for the road. The ADT for the roads may be found in the Roadway Plans, Traffic Volume Maps, planning documents or through the NCDOT GIS Servers (SDV online). In the same pop-up menu where the ADT is inputted, select what type of route the road is and the day of the week that flagging will primarily occur.

At this juncture you will be creating two different runs.

*Steps 14-17 will be the **first** in which you will determine the worst case scenario of a flagging operation for an entire 24 Hour period.*

Step 14: In the hourly restrictions box located at the top of the form, select the "Ignore hourly restrictions" option

Guidance: This will be your inputs for the 24 hour run which will provide you the highest hourly cost and the total daily cost for the worst case scenario.

Step 15: Select the "Simulate Flagging Operation" button. Select the "Return to Input Sheet" button.

Step 16: Select the "Print" button. Gather your print out.

Step 17: Select the "Save Flagger Data" button.

Guidance: Save the flagger data in the "usercost" folder under the project's working directory. This will allow you to have access to it in the future if you need to revisit it for any reason. The saved file can be brought back into the FLAGGER Program by selecting the "Load Flagger Data" button and selecting the appropriate file.

*The **second** run will determine user cost after applying any lane closure time restrictions.*

****** Perform Step 18 if you have any lane closure time restrictions on the road being analyzed; otherwise, go to Step 20.******

Step 18 & 19 will cover the second scenario.

Step 18: Select the "Use hourly restriction" option at the top of the form. Then, in the Lane Closures Restrictions? box, toggle the "No" to "Yes" if applicable for the hours that lane closures will not be allowed.

Guidance: This will be your inputs for the time restrictions run which will provide a cost to help determine the liquidated damages if the contract exceeds the Contract Time.

Step 19: Repeat Steps 15, 16, and 17. Then go to Step 20.

Step 20: Select the "Exit Program" button to close out of the program.

NOTE: The "Clear Worksheet" button may be selected if there are multiple flagging analysis that need to be run. The "Clear Worksheet" button will remove all information inputted into the program. IMPORTANT: Be sure to print and save the file (if you want to keep it) before selecting the "Clear Worksheet" button.