

**Attachment B - Justification request for rewording of Project Task 2**

**AS REPORTED FOR THE: QUARTERLY REPORT, SEPTEMBER 30, 1998**

July 1, 1998 – September 30, 1998

**Prototype Demonstration of a Geographic Information System Application For the Seasonal Analysis of Traffic Data, Development of Seasonal Factors And Seasonal Adjustment of Roadways**

**Justification request for rewording of Project Task 2 (approved)**

Subject: Highway Research Project 99-5

"Prototype Demonstration of a Geographic Information System Application for the Seasonal Analysis of Traffic Data, Development of Seasonal Factors and Seasonal Adjustment of Roadways"

Project Authorization To: The Institute for Transportation Research and Education (ITRE)

Proposal for modification of task methodology

NCDOT Project Monitor David White, P. E., ITRE Principal Investigator Jay Novello, and NCSU Project Advisor Dr. Tom Johnson (herein referred to as "the core project group"), recommend that one item in the Project Proposal undergo a wording change, based on research conducted under the terms of the project to date. We are presenting our findings and requesting comments from the Project Technical Committee prior to proceeding in the manner outlined in this message.

In the outline of the Research Methodology and Tasks in the Project Proposal, Task 2 specifies the development of an application to assign a "best guess" seasonal group to each short-term traffic count site in the pilot area, based on the most recent readings at that site. In the detail item "c" for this particular task, it is stated that "the application will be run as an unattended process, and no user input will be required". The core project group recommends deleting this sentence from the project methodology.

The statistical analysis software considered for project task 2 included Microsoft Excel, Systat, SPSS, ARC/INFO, SAS JMP and "Big" SAS. Excel and ARC/INFO were eliminated from consideration early in the project research due to their lack of core statistical analysis and visualization features. Excel will do basic statistics, but it is not

suitable for exploratory comparisons that seem to be important to assign a station to a Seasonal Group. Systat and SPSS are expensive packages and present a steep learning curve. Consideration then focused on "Big" SAS and SAS JMP. The core project group has identified the following key points about each of these packages:

"Big" SAS:

- Can be programmed to run in unattended "batch" mode
- NCSU Statistics Consulting Group can be contracted to write program
- Output primarily in tabular form
- More difficult to apply informed engineering judgment for group assignments (almost a "Black Box" approach)
- Licensing cost extremely high
- Large program such as "Big" SAS will be required if all 50,000+ stations are analyzed at once

SAS JMP:

- Interactive data-exploring interface
- Easier to investigate the integrity of the data
- Methodology for determining "best guess" for each count station already researched and demonstrated by Dr. Johnson, who will document this approach in "cookbook" format under terms of the current project
- Feasible for projects assigning a few hundred stations at a time
- Output in graphical or tabular format
- Supports informed engineering judgment in group assignment
- Current version cannot be programmed to run in "batch" mode, but upcoming beta version (3Q 1998) promises this functionality
- Purchase price affordable (approximately \$800)

Based on this information, the core project group recommends using an existing user driven, interactive software package versus developing and programming a fixed, inflexible statistical batch program.

Task 2 requires the development of a statistical application that assigns a "best guess" seasonal group to a short term count site. This requirement will be met using the user-interactive SAS JMP Statistical Discovery software. This approach is considered to be superior to the non-interactive unattended batch mode.

Dr. Johnson will develop and document a step by step statistical methodology and procedure using the SAS JMP Statistical Discovery software.

The results from SAS JMP will be data input to the GIS application as outlined by Task 3. Task 3 and the functionality of the GIS application has not been changed nor modified by this new statistical analysis approach.

Before we proceed and continue to develop this proposed methodology, the members of the Technical Advisory Committee are solicited to provide any comments, suggestions, or alternative proposals to Jay Novello and David White by September 8th, 1998. Members of the Technical Advisory Committee who do not respond to this solicitation will be considered as concurring with the new statistical "best guess" approach. If additional information is required, please contact David White. After reviewing the comments from the Technical Advisory Committee, the core project group will address the T. A. Committee comments and attempt to finalize a scope for Task 2.

Thank you for your attention to this matter.

David White, P. E. (dwhite@tpswp01.dot.state.nc.us)

Dr. Tom Johnson (tom\_johnson@ncsu.edu)

Jay Novello (jay@itre.ncsu.edu)