

December 31, 2002

Ms. Shelly Row
Federal Highway Administration
Office of Transportation Operations
400 Seventh Street SW, HOTO
Washington, DC 20590

Dear Ms. Row:

Attached is a document supporting the New York State Thruway Authority's request to experiment with a reverse color chevron. As indicated therein, it is anticipated that the duration of the experiment will be approximately twelve months. However, if the evaluating committee reaches a consensus that the visual impact of the new devices is significantly less than that of the traditional chevrons, or there appears to be a significant safety concern attributable to the reverse color chevrons, the experiment will be immediately terminated.

If you have any questions or need additional information concerning this request, please feel free to contact me via mail at the address above, or by telephone at (518) 471-4453, or by e-mail at Pete_Gustafson@Thruway.State.NY.US.

Sincerely yours,

H. Peter Gustafson
Director, Office of Traffic Engineering

HPG:ad
Enc.

cc: G. Tanner

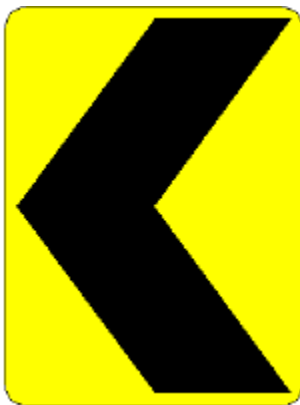
New York State Thruway Authority - Request for Experimentation - Reverse Chevrons Horizontal Alignment Signs -

Unexpected changes in the horizontal alignment of a roadway can take a motorist unaware and these changes can be a leading contributory factor in run-off-the-road vehicle accidents. Roadside delineation is the principle tool used by highway agencies to define these changes and to alert motorists. Typically pavement striping, raised pavement markers, post mounted delineators, curve warning signs, and chevron signs are used to provide the required delineation. The effectiveness of these tools can be affected by many factors, such as the geometry of the road, travel speeds, ambient lighting conditions, and differences in driver perceptions. A significant amount of research (1-4) has been undertaken to investigate which countermeasures provide the best performance; however, results have been inconsistent. Most of the current design guides and practices continue to be based on rules-of-thumb and past practice rather than scientifically validated information (4).

Recently, the Authority has received complaints about the chevron signs used to mark tight horizontal curves on entrance and exit ramps. The complaints focused on the visibility of the existing signs and the need to improve both the visibility and contrast for older drivers with degrading eyesight. Because of the lack of scientific methods to evaluate these complaints, it is proposed to conduct a field experiment to evaluate alternative designs.

Figure 1 shows the current M.U.T.C.D. (W1-8) **Chevron Alignment Sign**. The sign consists of a black arrow on a yellow background, which follows the standard color scheme stipulated in the MUTCD for highway warning signs. **Figure 2** shows the **Proposed NYSTWY Experimental Chevron Sign**, which is essentially a reverse of the M.U.T.C.D. sign and consists of a yellow arrow on a black background.

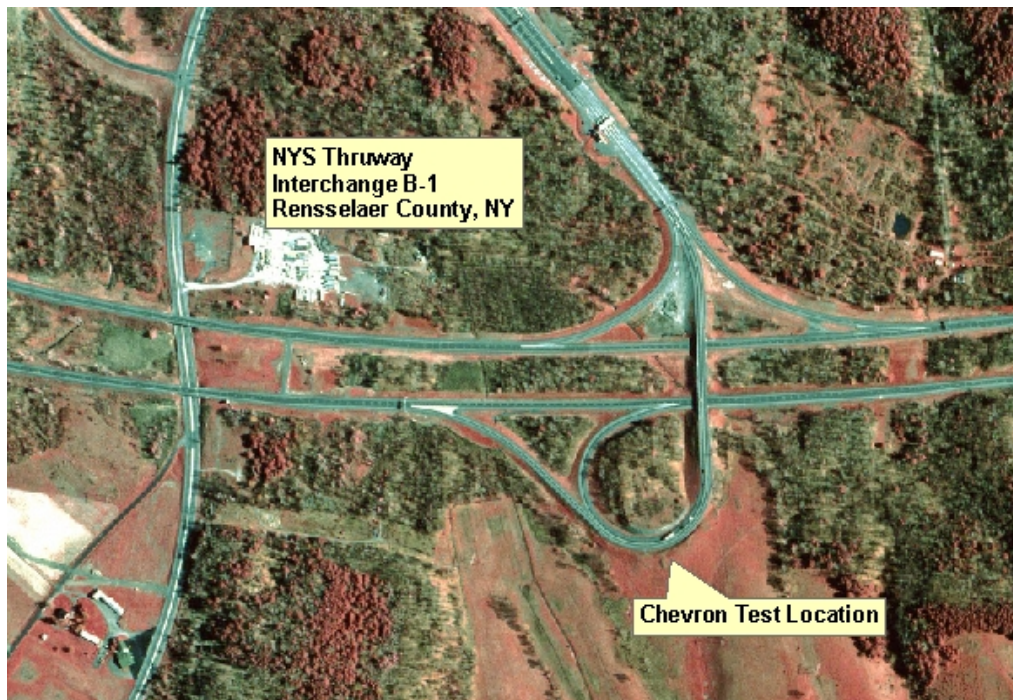
The intent of the experimental design is to create greater contrast between the directional arrow and the black background. The existing sign employs a black arrow on a yellow



background. It has been suggested that at night, and in inclement weather, the black and yellow contrast on the M.U.T.C.D. sign can wash out and the definition of the arrow can be lost. It is theorized that the reverse chevron will highlight the arrow, which will be the predominant reflective element of the sign. The black background will blend in with the night sky but the

arrow will remain well defined and visible. A prototype of the proposed reverse chevron design was produced and the initial reactions were favorable. This initial reception has created the desire to conduct field test on the design.

The site being considered for the trial is located at the B-1 Interchange on the Thruway's Berkshire Spur in Rensselaer County (shown below). The ramp is currently signed with standard chevron warning signs. The experimental design will consist of removing half of these signs and replacing them with the reverse chevron design. This will provide the opportunity to create a side by side comparison of the two systems under equal field conditions. A panel of evaluators will be used to view the site during daytime and nighttime lighting conditions and their opinions will form the basis for the evaluation.



An analysis of accident data will also be conducted following the installation of the experimental signs to note any changes in patterns. However, there is not currently a significant history of accidents at this location, which can be attributed to the curve. Since 1996, six (6) accidents have occurred which could possibly be related to the curve. All of these were daytime, dry weather accidents and were likely the result of driver inattention or excessive speed. Since 1986, there have been a total of 29 accidents, 20 of which could possibly be attributed to the horizontal alignment.

It is anticipated that the duration of the experiment will last for approximately 12 months. This will allow sufficient time for motorists to become adjusted to the change in signage and will allow for observations under a variety of weather and visibility conditions. Following the completion of the evaluation period the site will be restored to existing conditions.

Two interim reports and a final report will be submitted to FHWA to document the experiment. The first report will document the installation and initial performance of the chevrons. A 6-month report will document interim findings and a final report will be submitted to FHWA for consideration of adopting the findings and recommendations.

References

- 1.) Zador, P., Stein, H.S., Wright, P, and Hall, J., *Effects of Chevrons, Post-Mounted Delineators, and Raised Pavement Markers on Driver Behavior at Roadway Curves*, Transportation Research Record 1114, TRB, National Research Council, Washington D.C. 1986
- 2.) Wright, P, Hall, J., and Zador, P., *Low-Cost Countermeasures for Ameliorating Run-Off-the-Road Crashes*, Transportation Research Record 1114, TRB, National Research Council, Washington D.C. 1983
- 3.) Pietrucha, M., Hostetter, R., Staplin, L., and Obermeyer, M., *Pavement Markings and Delineation for Older Drivers*, FHWA-RD-94-145, Federal Highway Administration, Washington D.C.
- 4.) Good, M.C., Baxter, G.L., *Evaluation of Short-Range Roadway Delineation*, Human Factors 28(6), The Human Factors Society, Australia, (1986)