

The Efficacy of Temporary Orange Lane Delineations in Active Highway Work Zones

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Abstract:

With over 100,000 crashes in the work zone per year, it is essential that we as builders discover innovative solutions to maximize field crew and public safety in high traffic areas. A recent trend in the Heavy Civil Construction industry has been the implementation of temporary fluorescent orange striping in active work zones. When traditional white or yellow lane markings are removed, a faint residue is left behind and as construction crews repeatedly shift lanes, multiple overlapping removal scars begin to create confusion for drivers. To eliminate this confusion as well as to reduce traffic speeds and increase awareness in the work zone, the Wisconsin Department of Transportation, the North Texas Tollway Authority, and the Kentucky Transportation Cabinet have conducted successful experimentations with orange lane delineations. The objective of this research is to measure the overall success rate of orange striping and to determine common obstacles faced during the installation, exposure, and removal of orange striping.

Keywords: Traffic Safety, Heavy Civil Construction, Lane Delineation, Road Markings, Work Zone Safety



North Texas Tollway Authority:

NTTA worked alongside the Texas Transportation Institute to implement and monitor the installation of orange striping in a construction zone lane shift area as part of a pilot project along the Sam Rayburn Tollway in August of 2019. This effectiveness of this trial was measured via vehicle lateral positioning (lane hits), retro reflectivity, color values, and public opinion surveys.

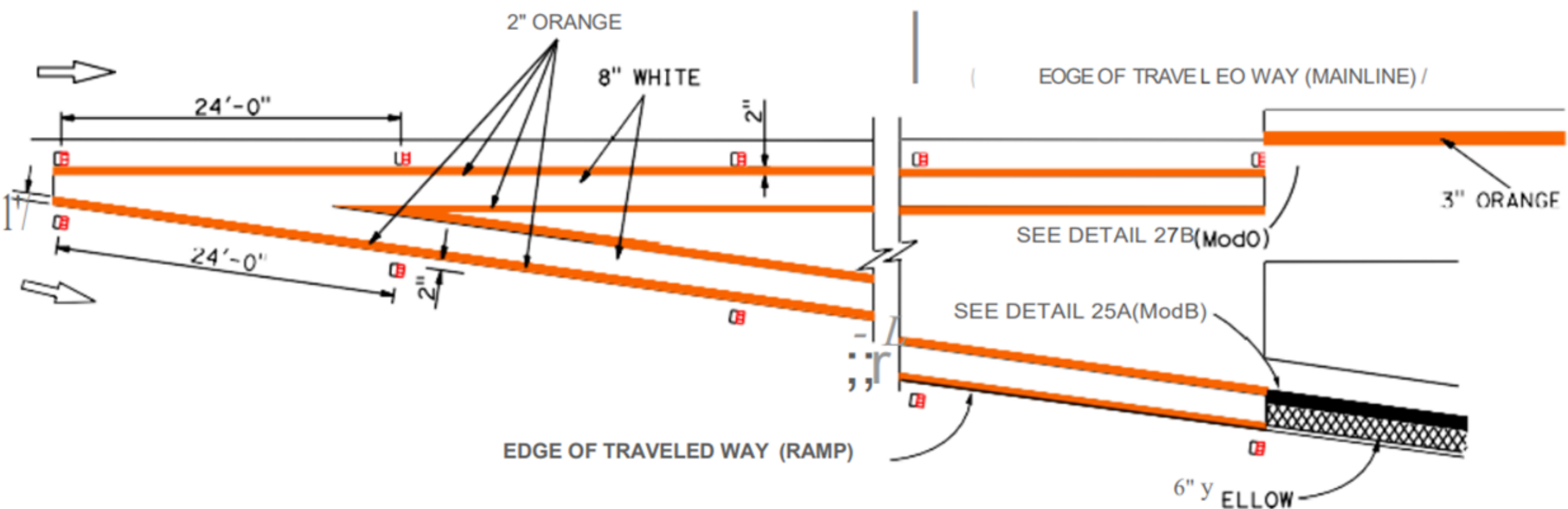
- Retro reflectivity data had decreased, and color values faded due to UV exposure
- NTTA was happy with the results of the initial trial and has since bid orange delineation striping as part of a new construction project.

Wisconsin Department of Transportation:

Orange delineations were utilized throughout the Zoo Interchange (I-94, I-89, and I-41), an area exposed to over 350,000 vehicles daily. Hundreds of orange paint, epoxy, and tape markings were installed and removed throughout the course of the experiment to determine which was most fruitful. The goal of this experiment was to help drivers navigate winter roads in the presence of snow, ice, and salt.

- WisDOT encountered several obstacles during this trial including color fading, bead retention, and added time and costs to clean out white/yellow paint trucks.
- Public survey results reported that between 75% - 80% of drivers preferred orange markings over the traditional white or yellow.
- Accident reports obtained before and after installation showed that the number of accidents remained the same.

Alternative 2 (Northbound): 2" wide contrast stripes along both sides of the 6" white line



CalTrans:

The most recent orange lane delineation trial is currently being executed by Caltrans district 11 along the I-5 freeway in San Diego, California. To determine success of the experiment, CCTV footage will be used to monitor motorist behavior when exposed to white and orange striping and California Highway Patrol will be consulted for collision occurrences and speed differentials.

- Lack of specifications have led to heavy reliance on manufacturer recommendations.
- Difficulties with 30 mil bead retention.

Kentucky Transportation Cabinet:

Orange delineation trials began in Kentucky along the Laurel County I-75 expansion project in October 2019. Orange delineations were accompanied by 8' painted speed limit markings to further emphasize the 55mph work zone. The success of this trial was measured by retro reflectivity, speed differentials, crash reports, and public perception.

- KTC found that orange striping is a good concept to delineate but requires substantially more research before it can be successfully implemented.
- Drivers reported that it was difficult to see the orange paint on rainy nights.
- Construction crews were unable to pass reflectivity tests despite multiple attempts.