9710000 TRAFFIC MARKING MATERIALS
COMMENTS FROM INDUSTRY REVIEW
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Comments (Internal Review):

Thank you for sharing the proposal to change the night time color requirements for yellow pavement markings in Florida. After reviewing, we believe that Florida DOT should seriously consider the below information prior to adopting the proposal as it is written.

The proposal includes a change from the current requirements included in the Code of Federal Regulations (23CFR655 subpart F) that define Standard Highway Colors. Further, the proposal would directly contradict recent findings discovered as part of the National Cooperative Highway Research Program Project 5-18 on the Color Effectiveness of Yellow Pavement Marking Materials.

This project examined the perception of drivers and their ability to correctly identify the color of pavement markings day and night. It was shown that drivers can confuse green-shade yellow markings with white markings at night. The Principle Investigators were Dr. Tom Schnell at the University of Iowa and Dr. Cameron Miller from the National Institute for Standards and Technology. Their report was finalized and submitted to NCHRP in December 2007 but since it has not been published, we cannot supply a copy of it at this time. We did, however, have the opportunity to review the findings with Dr. Schnell who supplied us with the following information. This is a quote from the "Summary of Findings":

" Under nighttime foveal (straight on) viewing conditions, it is evident that the highest percentage of yellow response (Figure 1) are centered near the bottom-right corner of the FHWA/ASTM D6628 (night time) color box. We propose a modified night time color box that better captures this human performance based response to yellow stimuli. The coordinates of this recommended nighttime yellow color box are...

[Yellow Night time]

x	y
0.53	0.47
0.49	0.44
0.50	0.42
0.51	0.40
0.57	0.43

Also we recommend changes to the nighttime white color box to better capture the human

performance based response found in this study. The coordinates of our recommended night time white color box are shown [below]"

[White Night time]

x	y
0.45	0.42
0.41	0.40
0.43	0.38
0.47	0.40
0.46	0.42

We've scanned figures 1&2 from the report and attached them below. They illustrate the current FHWA requirements for daytime and night time color and the recommendations made. Note that the draft proposal from Florida DOT is directly counter to these findings. Rather than restrict yellow markings to the red-shades, the FDOT proposal *disallows* the more effective colors and requires the more confusing ones. It also extends the allowable region of yellow into the area that is currently perceived as white.

At meetings of ASTM Sub committee D4.38 in both June and December of 2007, Carl Andersen of FHWA reported on the status of the NCHRP 5-18 investigation. He has indicated that he supports the NCHRP recommendations. He explained that we should expect a Notice of Proposed Rule making that would amend the current Code of Federal Regulations for Standard Highway Colors that would be consistent with the NCHRP work. While it is obviously premature to predict exactly when this Notice will be published, it seems completely at odds with the current proposal at FDOT.

We believe it to be in the interest of FDOT and the drivers of Florida to avoid making a mistake in this regard. We strongly recommend that FDOT revise their draft and instead, conform with the current federal color standards or amend their draft to conform with the NCHRP recommendation above.

One final note concerning "in-service color" requirements. Attached here is a correction to the Final Rule that established the Standard Highway Colors in the CFR.

This correction states that there is not sufficient understanding of the durability and weathering of materials to apply the standards through the entire service life of the materials in the field. It asserts that more study is required before service life requirements are established. We concur. We believe that the use of service life limits in the Florida specifications may be unnecessarily limiting. We recommend that FDOT adopt the requirements contained in the Code of Federal Regulations (or as modified for night time as recommended above) but to strike requirements for in service use until more understanding of these limits is established.

We'd be happy to further discuss the recommendations contained herein with FDOT.

Thank you for your consideration on this urgent matter and I hope that we may meet to further discuss these issues prior to a formal specification revision is adopted.

Response: The night-time yellow coordinates are the same coordinates in ASTM 6628. These are the same coordinates that we have used since January 2006 when we adopted ASTM 6628 for our color requirements. The removal of the white color requirements was based on our evaluation of all the markings since 2006. Our evaluation indicates there are no products that fall outside the color box and the white chromaticity box serves no useful purpose.

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Martin Yount
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January 23, 2008

Florida Department of Transportation
605 Suwannee Street
Tallahassee, Fl. 32399-0450

Att: Duane F. Brautigam, P.E. State Specification Engineer

RE: Specification Review Proposed Specification Change: 9710000 Traffic Marking Materials

Gentlemen,

In review of the above, copy attached, I would like to offer to you the following comments:

In as much as this is primarily a manufacturers place to review and respond more importantly that a contractor I have reviewed this and find a few things that I feel would benefit the Department as well as some questions.

971-3.3.3 Retroreflectivity
It is stated that the white and yellow must meet 150 mcd/lx.m2 after 6 months. Has a test been done for this? While six months may work in many areas of the state down south where most of the traffic is you cannot achieve this with paint. The specification should more relatable to traffic counts or it should be that the Department does not let the project go that long after painting on final surface until the permanent markings are installed. I would like to see the outcome of any testing that was done with a traffic count consideration.

TRANSMARK INC.
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DEERFIELD BEACH
FL 33443

Comments:

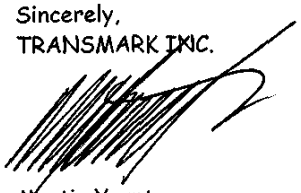
971-5.5.3 Durability
With regards to this specification concerning thermoplastic you state "thermoplastic material line loss must not exceed 5% at the end of the service life". At the end of three year service life a 5% loss seems to be very aggressive. You can have that much loss and more from just the oxidation of the sun upon the materials. Again is there a test in relation to traffic counts. In the south end of the state where there is considerable more traffic this may not be achievable. I believe it cannot be achieved in most cased in South Florida due to the conditions. The specification state the millage and the only way would be to increase millage or formulate a different material?

971-7.5.1 Retroreflectivity
This relates to permanent tape. If thermoplastic has to achieve a reflectivity of 450 for white and 350 for yellow I do not understand why permanent tapes would be allowed to be of lower numbers, 300 for white and 250 for yellow. Thermoplastic is melted and final production is completed on the project to achieve the required numbers and is very difficult. Permanent tape is manufactured in a controlled environment and should have at least the same numbers as thermoplastic if not higher in my opinion.

971-9 Two Reactive Components Materials
It is my opinion and only my opinion that the State of Florida has a unique position as far as weather and that thermoplastic is by far the best and least expensive in the long run. Two reactive component materials are used up north where conditions are different. This material is more expensive and there are very few contractors that do this or even have the equipment to do this. This would disrupt the whole industry and possibly even cause some much hardship in gearing up to do a completely different materials and installation. This would be the equivalent to changing our roads from asphalt to all concrete but on a smaller scale of course. The state has the best and cheapest way with thermoplastic and to change that would be a shame for the taxpaying public.

As I said previously it is more important in this area to get manufacturers input more than contractors, however, the above comments are just observations and concerns which I have both as a taxpayer and contractor who installs these materials. If I can be of any further assistance please contact us at your convenience.

Sincerely,
TRANSMARK INC.



Martin Yount
Contract Administrator

Response: The industry review is intended for the proposed revision to the specifications. Since your comments are not related to the proposed revision, they will be addressed in this review. The comments have been forwarded to Chester Henson in the Department for a response to your comments.

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