Oregon Traffic Control Devices Committee

Meeting Minutes

March 21, 2003

Marion County Public Works, Salem, Oregon

Members Present: Joseph Marek, Chair, Clackamas County; Eric Niemeyer, Vice Chair, Jackson County; Ed Fischer, Secretary, ODOT State Traffic Engineer; Charles Radosta, ITE/Kittelson & Associates; Jim Rentz, OSP; Robin Lewis, City of Bend; Cynthia Schmitt, Marion County; Randall Wooley, City of Beaverton; Bill Ciz, ODOT Region 1

Members Absent: Rob Burchfield, City of Portland

Others Present: Nick Fortey, FHWA; Ed Chastain, Lane County; Brian Genovese, City of Eugene; John Irwin, JRH Engineering; Bill Kloos, City of Portland; John Replinger, Multnomah County; Kevin Hottmann, Terry Hockett, City of Salem; Kent Kacir, Siemens Inc.; Chris Brehmer, Kittelson & Associates; Cathy Ardanaz, 3M Inc.; Tarno Colman, Bill Brownlee, Marion County; Rick Braden, Oregon State Parks; Orville Gaylor, Julia Wellner, Gary Obery, June Ross, Rick Wood, Doug Bish, Paul Davis, ODOT Traffic Management Section; Gretchen McKenzie, Larry Christianson, ODOT Transportation Safety Section

Introduction/Approval of January 17, 2003 Meeting Minutes

Chairperson Joseph Marek called the meeting to order and attendees introduced themselves. Chair Marek asked for additional agenda items. Orville Gaylor said he had 2 short informational items and Ed Fischer said he had two items relating to signal guidelines if time permitted. Joe then asked for approval of the January 17th minutes. Paul Davis noted Eric Niemeyer as being from Jackson County. Charles Radosta then moved, Randall Wooley seconded, and the committee voted approval of the January 17, 2003 meeting minutes as amended.

Old Business

Sign Retroreflectivity Standards

Orville Gaylor corrected the record on his statement at the last meeting that 3M's Engineering Grade sign sheeting is not retroreflective. It is in fact retroreflective but there is still a question if it meets the definition of "retroreflectivity" in the MUTCD. Sign sheeting technology has advanced to the point that other sheeting is much higher in retroreflectivity, has a longer life-span under warranty, and is easily more cost effective now. Orville handed out a page out of a TRB presentation in January with a table on recommended minimum retroreflectivity standards and other older sheets that included reflectivity values for various colors and sheeting materials, cost and reflectivity/warranty/installation location data to illustrate his point. Ed Fischer asked Nick Fortey where FHWA was in setting retroreflectivity standards. Nick said that while it's been ten years since the law directing minimum retroreflectivity values, FHWA isn't done studying yet. Whatever minimum that's set will have certain cost and liability issues so when FHWA is ready, they will go through the rule-making process. Cathy Ardanaz said she understood that there would be some kind of a grandfather sunset period in which to change over to higher grade sheetings since it will be considered an unfunded mandate.

Crosswalks on Channelized Right Turn Lanes

Julia Wellner handed out her updated wording and revised diagram for a proposed Oregon Supplement regarding crosswalks placed a car length behind Stop and Yield lines at unsignalized turn lanes. She hadn't received further input since the last meeting, so she incorporated previous suggestions and cleaned up the previous draft. The committee discussed the changes but had no significant concerns. The change will not be incorporated until the next version of the Oregon Supplements comes out, after the next revision to the MUTCD is published.

Decision: Ed moved that the committee accept the draft supplement as an optional use at unsignalized right turn lanes with raised islands to be included in the next revision to the Oregon Supplements. Cynthia Schmitt seconded, and the committee approved.

Left Turn Signal Phasing Guidelines

Ed Fischer, reminding the committee of Eric Niemeyer's suggested changes dealing with left turn signal phasing, said this was timely since ODOT has been working on an update to the Signal Policy and Guidelines since last summer. He shared a draft of the changes and said he was ready to discuss Eric's suggestions. Ed said this is information only, and no decision is currently requested. In light of increased interest in replacing *Protected Only* left turn phasing with *protected/permissive* phasing, Traffic staff wanted the Guidelines to adequately address issues that should be considered when determining if less protection could be provided to left turning vehicles at an intersection. Review of crash data for selected intersections showed that in some cases the number of crashes increased significantly after protected only left turn phasing was replaced with protected/permissive phasing. Older drivers also seemed to have significantly higher crash involvement at intersections with protected/permissive phasing than at intersections with protected only left turn phasing.

The new draft guidelines are more explicit about factors that should be considered in the analysis for revising the phasing at an intersection to provide less protection to drivers turning left. The factors are hourly left-turn volume criteria for protected only left turn phasing and average delay per vehicle entering the intersection for the current and proposed phasing. The draft also requires that protected only left turn phasing be reinstalled if crashes increase significantly after the phasing is modified. Additional criteria for hourly left turn volumes are included that are consistent with the guidelines for left turn phasing treatment in TRB research. Also the standard display for new installations of protected/permissive or permissive/protected left turn phasing on Oregon state highways will now be a four section vertical head with a flashing yellow arrow. Possibly the lower head of a three section head can be bi-modal (flashing yellow arrow) if a good yellow LED light becomes available. Ed said he was still a little concerned about not having the movement in the display help indicate that a change is coming. So for the state highways, the flashing yellow will be used with the four-section head with the understanding that when good yellow LED's become available, the three-section display may be used with a bi-modal bottom section capable of displaying solid green or flashing yellow arrows..

Eric Niemeyer said that protected only phasing is overall safer than permissive left turn phasing but efficiency as a safety factor should also be looked at when coming up with guidelines. His concern was that since many jurisdictions use ODOT's guidelines as their manual, proposed changes need to keep them in mind. He questioned item d on page one of the draft regarding recent crash history for a 12-month period, whether this was in cases where no signal exists. Ed clarified that there could be an existing signal, without a left turn phase included or where no signal currently exists. Ed said this was intended to acknowledge that left turn crashes are one thing that needs to be considered. This originally came from a 1981 FHWA paper entitled "Guidelines for Signalized Left Turn Treatments". A more generic recommendation of 12-month period indicating five or more left turn crashes has been in the guidelines since 1990. In determining the exact treatment, the investigator should carefully review the type and approach of individual crashes. It's important to note that the guidelines state that protected only left turn phasing should be provided if left turning type accidents per approach equal three per year or five in two consecutive years.

Eric said the speed of approaching traffic can be used as an indication of need for establishing some kind of left turn phasing, but wasn't so sure it should be absolute justification for protected only phasing. He thought it should be more based on engineering studies, crash history, etc. Ed said this requirement comes from ITE research in 1999 (Koupai) in six states that found the threshold for protected only phasing when the speed is 45 MPH was appropriate and consistent with studies in several different states. Protected/permissive is generally better for efficiency but not for safety at speeds at or over 45 MPH or when protected only was currently in place and speeds were over 35 MPH. Ed said ODOT had to err on the side of safety. Eric said he'd prefer some wording allowing for some engineering judgement. Eric said he understood that the basic reason for the 45 MPH rule was just because it's what other agencies are currently doing. Ed said maybe so but at least the implication of the study he's seen is based on an evaluation of crashes. Eric said rather than a rule of thumb, other intersections on the corridor should be considered, look at unsignalized left turn lanes adjacent to the intersection under consideration, etc. He thinks the guidance should require the engineer to justify why protected only left turn phasing was used, rather than why it was not. Volume of left turns, for instance might make this entirely too inefficient. Ed asked for further discussion on how such flexibility might be provided for while still emphasizing first priority for providing a safe turning movement.

Ed noted Eric's further suggestion on "protected permissive left turn phasing should be used" from the current "may be considered". Ed said he didn't want to go that far but was willing to say "should be considered". Eric suggested also saying "should be considered" instead of "should be provided" on the section on protected only left turn phasing. Ed said that was a possibility worth exploring.

Eric asked for some clarification on sight distance and the committee discussed it. Eric had suggested a note as follows:

"This table represents the minimum sight distance required after considering stationary sight line restrictions and/or roadway geometry. Opposing left turning vehicles which restrict the minimum required sight distance should exceed 100 vehicles per hour and/or be present during a substantial portion of the permissive left turn phase before they are considered a stationary sight line obstruction."

Ed said he'd prefer not to include the note, seeing it as too prescriptive and not based on any concrete research. He said there is still the flexibility for local jurisdictions to use engineering judgement based on local conditions without the note. He said he understood where Jackson County is coming from and said ODOT has gotten more permissive over time but isn't ready to go as far as some would like.

✓ Action Item: Committee members and interested others should continue to review the proposed draft addendum on left turn signal phasing and pass on anything to Rick Wood or June Ross by April 15th. Members asked for an email copy with any updated corrections.

Flashing Yellow Protected Permissive Signalization

Chris Brehmer and Kent Kacir presented research results and demonstrated protected/permissive flashing yellow signal arrows displays. An executive survey was shared with members. The project was to evaluate the safety and effectiveness of different types of protected/permitted left turn signal displays. They started by looking at current displays and how well they are understood, and then looked at potential new displays to test in the field with the goal of recommending a new display or displays for use across the country uniformly. A key hope was to eliminate the "yellow trap". Their research found that pretty much every color combination and arrow/circular variation possible is already in use so they started looking at the list. The MUTCD isn't very specific in how to implement the display so various states do it differently. Driver surveys and crash data was collected. Initial study results were discussed. They decided the circular green was a national standard that should be retained and the flashing yellow arrow also looked promising. It hasn't been used a lot so there's not much data on it yet. A driving simulator was used to study driver response to displays and see how well they were understood and responded to. Twelve different displays were tested which found no real difference between flashing yellow arrow and green ball but they considered it significant that the little-known yellow arrow was doing as well as the green ball -- and very promising for a new display. To see how this works in the "real world", they started an implementation study with eight different agencies to participate on

a voluntary basis to see how well people respond to it and what technical issues may come up in implementation. Six sites on both coasts were used. Each jurisdiction was asked to put the displays in at three different places, using four-section, all arrow displays. Some initial resistance passed as the signals proved understandable and workable. Supplementary explanatory signing was not used because they wanted to find out if it was intuitive enough to not need signing. Citizen feedback was generally positive. Preliminary before and after studies showed that the flashing yellow arrow is well understood by motorists without need for supplemental signing. It's done just as well as the green ball but fewer people are pulling into traffic with the arrow than the green ball when they shouldn't be. Many people seemed oblivious to the change even having happened. The display has an advantage over the doghouse display in that it can be used in protected mode only, permissive mode only, or as protected/permissive at different times of day.

The research panel findings have been presented to the NCHRP National Committee. A final report should go into publication in the next couple months. They'll meet with the National Committee again in June and an AASHTO Traffic Engineering Committee to answer any questions or concerns, and then make the information accessible to the public/traffic engineering community. There should be a website later in the year with all the data and studies. Kent added that there are very few devices in the MUTCD that have had more research than the flashing yellow arrow. They didn't know it would work so well. They were impressed with the flexibility, for lead or lag turns, span wire or mast arm mounting, curved or straight intersections and drivers understanding is demonstrably as good as the green ball. The down side is that there are potentially two displays in the manual that mean the same thing. Another potential problem is that after people have been trained in one area, what happens if these people go to other areas that just have the green ball. More study will be done as necessary to answer any further questions from FHWA.

Ed asked Kent if anybody had tried this in a three-head display and/or the bi-modal head, and whether the moving arrow is demonstrably helpful or just intuitively so. Kent said there wasn't any research on the question. The Jackson County display was discussed with the NCHRP but the panel saw no problem with it particularly if the left and through displays both clear at the same time. They weren't ready to make a formal reaction to the recommendation without more time to digest the information but were positive and everybody seemed to agree the flashing yellow arrow is in the future. In the meantime, other jurisdictions can use it on an experimental basis, with the only requirement to collect before and after data. A final computer side-by-side simulation of the traditional doghouse and the flashing arrow display demonstrated the elimination of the "yellow trap" with the exact same phasing used for both displays.

Chris and Kent are willing to update the committee in July or October after the presentation to the national committee.

Drivers Response to Traffic Signal Power Outages

Eric Niemeyer and Joe Marek following up on previous discussion by the committee, presented some proposed language for a new law regarding driver responses to non functioning signals. After further discussion of questions and issues, and some consensus that something should be done, the committee decided it was too late to do anything this legislative cycle. The subcommittee will continue to work on language.

✓ Action Item: Cindy Schmitt, Robin Lewis, Joe Marek and Eric Niemeyer will continue to look at crafting language for the next legislature.

New Business

Legislative Update

Ed Fischer briefly discussed a handout of current legislative initiatives that the Traffic Management section is interested in.

May 16th ITE/OTCDC meeting in Bend

Joe Marek announced that the location for the May 16th ITE/OTCDC meeting has been decided. It will be at The Inn at the 7th Mountain in Bend.

Non-Agenda Items

DUII Signing – Larry Christianson from ODOT's Safety Section introduced the Infrastructure Safety Investment Program which includes signing projects such as the "Safety belt click it or ticket" signing. DUII signing is part of the project. Larry said he is looking for conceptual input regarding the sign design. He said there is not yet any acceptable international symbolism for DUII signing. Gretchen McKenzie gave more detail on preliminary ideas for signing which will be given to local jurisdictions for placement on other than federal highways. The Safety Section would like the OTCDC to vote on a design to be provided later on and whether it would be acceptable on city and county roads. The committee gave some general feedback on the preliminary design which was too cluttered and detailed to work. It will be an informational, not regulatory, sign. The timeline is short but there will be a Multidisciplinary Task Force (DUII) Conference April 11th in Tigard and they'd like committee response in time to have signs ready to give as awards to local jurisdictions at that conference. An electronic copy should be sent to members for a vote when it's received.

✓ Action Item: ODOT's Safety Section will come up with a final design and get it to Traffic Management Section. Traffic Section will get these to members as soon as possible, collect votes, and advise the Safety Section of results.

Lewis & Clark Trail Signing – Orville Gaylor advised members that ODOT is reviewing Lewis & Clark Trail signing now since the 150th anniversary is coming up.

Port Orford Cedar Wood Posts – Orville advised of problems with Port Orford cedar replacement posts. It turns out they're not naturally resistant as hoped for. They are rotting in certain places and mostly on smaller posts, not big ones. The reason for the rotting isn't yet known. Some regions want to give up on the posts, and go back to treated posts, but others don't. Orville advised any members who are using the Port Orford posts to go out and check their condition.

The meeting Adjourned at: 12:30 p.m.

Our next meeting is scheduled for May 16th, 2003 at 9:00 a.m. at the Inn at the 7th Mountain in Bend (map on next page).

Inn of the 7th Mountain - Map

Once you've reached Bend, finding the Inn just 5 miles West is easy! Most roads into Bend will land you on Highway 97 (Bend Parkway)...just look for
Exit 138 (Colorado Street/Mt. Bachelor). Follow Colorado Avenue west through town and go through two roundabouts. Take the Century Drive turn at the second roundabout and continue on 5.1 miles to the entrance to the Inn, just past Widgi Creek Golf Course.