National Committee on Uniform Traffic Control Devices
RWSTC

RWSTC agenda item III.5, January 2014

TECHNICAL COMMITTEE: R&W Signs Technical Committee

DATE OF ACTION (TASK FORCE): 6-11-13, revised 12-22-13 following sponsor comments

RWSTC APPROVAL: 6-27-13

TRANSMITTAL TO SPONSORS: November 2013

RWSTC APPROVAL DATE: 1-8-14

COUNCIL APPROVAL: 1-10-14

ORIGIN OF REQUEST: EV Task Force

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TOPIC: Electrical Vehicle (EV) Signs

AFFECTED SECTIONS OF MUTCD: Section 2B.46, 2B.47 and Figure 2B-24

SUMMARY:
Electric vehicle (EV) parking signs have been emerging throughout the country with little uniformity, consistency, or any study of recognition of the best way to convey the restrictions and regulations intended. FHWA provided interim approval of a symbol for EV and there has been substantial activities by states in implement EV initiatives including the provision of uniform signing. The task force objective was to find the best, more consistent and uniform signs for reserving parking for charging EVs both on-street and off-street.
RESEARCH:
The following publications have been reviewed relative to these added requirements:

- **Interim Approval for Optional Use of an Alternative Electric Vehicle Charging General Services Symbol Sign**, FHWA, HOTO-1, April 1, 2011.
- **Zi-128 EV Internationally recognized Symbol Final Approval**, British Columbia Ministry of Transportation and Infrastructure, November 2012.

DISCUSSION:  On April 1, 2011 FHWA issued interim approval for the use of an Alternative Electric Vehicle Charging General Service Symbol Sign. The content of that approval focuses on the D9-11 series type sign and section 2I.02. However, the appropriate application of the sign is wayfinding not regulation of on-street and off-street parking spaces for sites open to public travel. The use of a blue sign to regulate parking space designation is not appropriate. This issue has been taken up by several western states, Canada and is relevant given the emerging development of EVs. However, most of these efforts represented individual or narrow committee recommendations without substantive research to determine what is the most recognizable message for this task – similar to the work done between 2008 and 2010 by FHWA as part of the pooled fund studies to determine the general service sign.

Following discussion of this topic at RWTC meetings in June 2012 and January 2013, the task force worked with Portland State University to conduct two human factors evaluations to determine what sign had the best recognition through research, making use of prior studies and sign messages. The first effort was undertaken by students to independently assess (through a class project overseen by Dr. Chris Monsere) if there was confusion in the messaging. It was found that there was confusion. This led to a
more detailed human factors survey effort conducted by students (through a class project overseen by Dr. Kelly Clifton, led by Deanna George & Benjamin Stolt) that emulated the pooled fund research effort to guide the development of the most recognizable sign.

The December 2012 PSU studies were cursory human factors efforts but it provided the following general findings:

1. More is less - no sign should have multiple plaques unless they are addressing separate issues (like pay to park and EV). The two word reserved parking seemed to fare well although several of the surveys compared it to conditions that it was not intended to address.
2. The EV symbol did well and had a 87% recognition that the symbol did NOT include hybrids.
3. If limits to parking are to be for charging activity - the word charging will need to be included.
4. No parking as a sign to indicate restricted parking for EV appears to be confusing between surveys with ranging results - mixed messaging
5. When it is not simply reserved EV parking (the MUTCD prototype from the handicap parking example seems to work well there), how multiple components are assembled for EV vs general parking, charging vs not charging, time limits, pay to park needs more consideration

The June 2013 PSU Study was a more detailed effort focused on the EV parking sign concepts for on-street and off-street parking, providing the following findings:

1. Use of no parking symbols to restrict parking for EVs confuses road users as to the message to park or not park
2. Use of the words “charging only” clarified the regulatory requirement that a vehicle must be charging (not just an EV) to utilize the space
3. The use multiple colored signs seemed to have higher recognition (green and black on white) which may outweigh the costs/complexity of multiple color production
4. Use of arrows on these signs confused users
5. The two signs below had the best recognition for addressing EV parking restrictions for off-street and on-street conditions. Key findings include:

Optional idea --->

- The use of the black EV symbol outperformed the blue or green for the reserved parking
Based upon recognition of other signs with CHARING ONLY messaging, replacing the arrow that is shown on the comparable R7-8 disabled person parking sign

While the two hour parking sign performed well, a further test or consideration of an all green or replacing the blue EV symbol with a black regulatory equivalent would be subject to RWSTC committee consideration.

The Technical Committee recommended use of green for the symbols over black for consistency in color and simplicity in sign preparation. Based upon the available research and studies conducted the following text is recommended for the MUTCD.

RECOMMENDED WORDING

RECOMMENDED WORDING:
Note: Proposed changes to the MUTCD are shown in underline red and removed text are shown in strikethrough red. Changes shown following sponsor comments are shown in yellow below

Insert the following new text shown in red to Section 2B.46 in paragraph 1 between signs 13 and 14:

Section 2B.46 Parking, Standing, and Stopping Signs (R7 and R8 Series)

Support:
01 Signs governing the parking, stopping, and standing of vehicles cover a wide variety of regulations, and only general guidance can be provided here. The word "standing" when used on the R7 and R8 series of signs refers to the practice of a driver keeping the vehicle in a stationary position while continuing to occupy the vehicle. Typical examples of parking, stopping, and standing signs and plaques (see Figures 2B-24 and 2B-25) are as follows:

1. NO PARKING ANY TIME (R7-1);
2. NO PARKING X:XX AM TO X:XX PM (R7-2, R7-2a);
3. NO PARKING EXCEPT SUNDAYS AND HOLIDAYS (R7-3);
4. NO STANDING ANY TIME (R7-4);
5. XX HOUR PARKING X:XX AM – X:XX PM (R7-5);
6. NO PARKING LOADING ZONE (R7-6);
7. NO PARKING BUS STOP (R7-7, R7-107, R7-107a);
8. RESERVED PARKING for persons with disabilities (R7-8);
9. VAN ACCESSIBLE (R7-8P);
10. Pay Station (R7-20);
11. Pay Parking (R7-21, R7-21a, R7-22);
12. Parking Permitted X:XX AM TO X:XX PM (R7-23);
13. Parking Permitted XX HOURS XX AM – XX PM (R7-23a);
14. RESERVED PARKING for charging electric vehicles (R7-24)
15. **XX HOUR Parking for charging electric vehicles (R7-25)**

Note: Renumber sequence below

16. XX HR PARKING X:XX AM TO X:XX PM (R7-108);

17. NO PARKING ANYTIME/XX HOUR PARKING X:XX AM – X:XX PM (R7-200, R7-200a);

18. TOW-AWAY ZONE (R7-201P, R7-201aP);

19. THIS SIDE OF SIGN (R7-202P);

20. EMERGENCY SNOW ROUTE NO PARKING IF OVER XX INCHES (R7-203);

21. NO PARKING ON PAVEMENT (R7-1);

22. NO PARKING EXCEPT ON SHOULDER (R8-2);

23. No Parking (R8-3, R8-3a);

24. EXCEPT SUNDAYS & HOLIDAYS (R8-3bP);

25. ON PAVEMENT (R8-3cP);

26. ON BRIDGE (R8-3dP);

27. ON TRACKS (R8-3eP);

28. EXCEPT ON SHOULDER (R8-3fP);

29. LOADING ZONE (R8-3gP);

30. X:XX AM TO X:XX PM (R8-3hP);

31. EMERGENCY PARKING ONLY (R8-4);

32. NO STOPPING ON PAVEMENT (R8-5);

33. NO STOPPING EXCEPT ON SHOULDER (R8-6); and

34. EMERGENCY STOPPING ONLY (R8-7).

Insert the following new text shown in red in Section 2B.47 between paragraphs 17 and 18 of the MUTCD:

**Section 2B.47 Design of Parking, Standing, and Stopping Signs**

Support:

01 Discussions of parking signs and parking regulations in this Section apply not only to parking, but also to standing and stopping.

Standard:

02 The legend on parking signs shall state applicable regulations. Parking signs (see Figures 2B-24 and 2B-25) shall comply with the standards of shape, color, and location.

03 Where parking is prohibited at all times or at specific times, the basic design for parking signs shall have a red legend and border on a white background (Parking Prohibition signs), except that the R8-4 and R8-7 signs and the alternate design for the R7-201aP plaque shall have a black legend and border on a white background, and the R8-3 sign shall have a black legend and border and a red circle and slash on a white background.

04 Where only limited-time parking or parking in a particular manner are permitted, the signs shall have a green legend and border on a white background (Permissive Parking signs).
Guidance:
05 Parking signs should display the following information from top to bottom of the sign, in the order listed:

A. The restriction or prohibition;
B. The times of the day that it is applicable, if not at all hours; and
C. The days of the week that it is applicable, if not every day.

06 If the parking restriction applies to a limited area or zone, the limits of the restriction should be shown by arrows or supplemental plaques. If arrows are used and if the sign is at the end of a parking zone, there should be a single-headed arrow pointing in the direction that the regulation is in effect. If the sign is at an intermediate point in a zone, there should be a double-headed arrow pointing both ways. When a single sign is used at the transition point between two parking zones, it should display a right and left arrow pointing in the direction that the respective restrictions apply.

07 Where special parking restrictions are imposed during heavy snowfall, Emergency Snow Route (R7-203) signs (see Figure 2B-24) should be installed. The legend will vary according to the regulations, but the signs should be vertical rectangles, having a white background with the upper part of the plate a red background.

Standard:
08 Where parking spaces that are reserved for persons with disabilities are designated to accommodate wheelchair vans, a VAN ACCESSIBLE (R7-8P) plaque shall be mounted below the R7-8 sign. The R7-8 sign (see Figure 2B-24) shall have a green legend and border and a white wheelchair symbol on a blue square, all on a white background. The R7-8P plaque (see Figure 2B-24) shall have a green legend and border on a white background.

Option:
09 To minimize the number of parking signs, blanket regulations that apply to a given district may, if legal, be posted at district boundary lines.

10 As an alternate to the use of arrows to show designated restriction zones, word messages such as BEGIN, END, HERE TO CORNER, HERE TO ALLEY, THIS SIDE OF SIGN, or BETWEEN SIGNS may be used.

11 Where parking is prohibited during certain hours and time-limited parking or parking in a particular manner is permitted during certain other time periods, the red Parking Prohibition and green Permissive Parking signs may be designed as follows:

A. Two 12 x 18-inch parking signs may be used with the red Parking Prohibition sign installed above or to the left of the green Permissive Parking sign; or
B. The red Parking Prohibition sign and the green Permissive Parking sign may be combined (see Figure 2B-24) to form an R7-200 sign on a single 24 x 18-inch sign, or an R7-200a sign on a single 12 x 30-inch sign.

12 At the transition point between two parking zones, a single sign or two signs mounted side by side may be used.

13 The words NO PARKING may be used as an alternative to the No Parking symbol. The supplemental educational plaque, NO PARKING, with a red legend and border on a white background, may be used above signs incorporating the No Parking symbol.
14 Alternate designs for the R7-107 sign may be developed such as the R7-107a sign (see Figure 2B-24). Alternate designs may include, on a single sign, a transit logo, an approved bus symbol, a parking prohibition, the words BUS STOP, and an arrow. The preferred bus symbol color is black, but other dark colors may be used. Additionally, the transit logo may be displayed on the bus face in the appropriate colors instead of placing the logo separately. The reverse side of the sign may contain bus routing information.

15 To make the parking regulations more effective and to improve public relations by giving a definite warning, a TOW-AWAY ZONE (R7-201P) plaque (see Figure 2B-24) may be appended to, or incorporated in, any parking prohibition sign. The Tow-Away Zone (R7-201aP) symbol plaque may be used instead of the R7-201P word message plaque. The R7-201aP plaque may have either a black or red legend and border on a white background.

**Guidance:**

16 If a fee is charged for parking and a midblock pay station is used instead of individual parking meters for each parking space, pay parking signs should be used. Pay Parking (R7-22) signs (see Figure 2B-24) should be used to define the area where the pay station parking applies. Pay Station (R7-20) signs (see Figure 2B-24) should be used at the pay station or to direct road users to the pay station.

**Standard:**

17 If the pay parking is subject to a maximum time limit, the appropriate time limit (number of hours or minutes) shall be displayed on the Pay Parking (R7-21 or R7-21a) and Pay Station (R7-20) signs.

**Guidance:**

18 Where parking spaces are reserved for charging electric vehicles, a RESERVED PARKING for charging electric vehicles (R7-24) sign (see Figure 2B-24) should be installed adjacent to the designated space.

19 Where on-street parking spaces are reserved for charging electric vehicle (R7-25) sign (see Figure 2B-24) should be installed adjacent to the designated space.

**NOTE:** Re-sequenced the paragraph numbering below

**Option:**

20 In rural areas (see Figure 2B-25), the legends NO PARKING ON PAVEMENT (R8-1) or NO STOPPING ON PAVEMENT (R8-5) are generally suitable and may be used. If a roadway has paved shoulders, the NO PARKING EXCEPT ON SHOULDER sign (R8-2) or the NO STOPPING EXCEPT ON SHOULDER sign (R8-6) may be used as these signs would be less likely to cause confusion. The R8-3 symbol sign or the word message NO PARKING (R8-3a) sign may be used to prohibit any parking along a given highway. Word message supplemental plaques may be mounted below the R8-3 or R8-3a sign. These word message supplemental plaques may include legends such as EXCEPT SUNDAYS & HOLIDAYS (R8-3bP), ON PAVEMENT (R8-3cP), ON BRIDGE (R8-3dP), ON TRACKS (R8-3eP), EXCEPT ON SHOULDERS (R8-3fP), LOADING ZONE (with arrow) (R8-3gP), and X:XX AM TO X:XX PM (with arrow) (R8-3hP).

21 Colors that are in compliance with the provisions of Section 2A.10 may be used for color coding of parking time limits.
Guidance:

If colors are used for color coding of parking time limits, the colors green, red, and black should be the only colors that are used.
Add the following graphics to Figure 2B-24:

R7-24

R7-25

The two following paragraphs are not intended for inclusion in the MUTCD. The two paragraphs are presented for information only as the National Committee and FHWA consider this Technical Committee Recommendation.

R7-24 is shown as a vertical rectangular white sign with a green border and the words "RESERVED PARKING" in green on two lines above a green electric vehicle charging symbol with the words "CHARGING ONLY" below in green. The sign can be applied to individual spaces which are accompanied by a charging station for electric vehicles.

R7-25 is shown as a vertical rectangular white sign with a green border and a black letter "P" inside a green circle. The words "2 HOUR" (or alternatively the desired time restriction) in white on a green background as shown. A green electrical vehicle charging station symbol is below the time restriction. The words “CHARGING ONLY” are below in green. The sign can be applied to individual spaces which are accompanied by a charging station for electric vehicles.

EV TASK FOR VOTE:
For: unanimous
Opposed:
Abstentions:

RWSTC Vote: 6-27-13
For: Unanimous
Opposed:
Abstentions:

RWSTC Vote: 1-8-14
For: Unanimous
Council Vote: 1-10-14
For: Unanimous
Opposed:
Abstentions:
C:NCUTCD/June 2013/McCourt/Electric Vehicle – EV signs revised 6-27-13, revised 12-22-13 following sponsor comments formatted 1-2-14, approved by RWSTC 1-8-14 following sponsor comments, approved by COUNCIL 1-10-14