INTERSTATE 405 Corridor Program
Congestion Relief & Bus Rapid Transit Projects

APPENDIX T1

Northwest Region Traffic Operations Redbook Section F

I-405, SR520 to SR522 Stage 1 (Kirkland Stage 1)

Request For Proposal
July 15, 2005

Washington State Department of Transportation

Date: May 10, 2002

From: V. Kientz

To: Traffic Administration Staff
Traffic Area Engineers
Traffic Operations Staff
Traffic Analysis Staff
Traffic HOV Staff
Traffic Operations Pavement Marking Staff
Headquarters Traffic Section

MA-1	Hansen/Campbell	MS-41
MA-2	Glass/Tate	MS-42
MA-3	Russell/Scholl	MS-43
MA-4	Golden	MS-44

Subject: NWR Traffic Operations RedBook Section F – Striping and Signing "Text" Guidelines

---

Attached for your information and use is Section F of the NWR Traffic Operations RedBook. Section F consists of the NWR striping and signing text guidelines. This section is a companion section to the RedBook Sections G and H, which are the striping and signing drawings.

Over the last ten plus years the NWR Traffic Operations Group has been issuing regional striping and signing guidelines. These guidelines supplemented the MUTCD, the WSDOT Design Manual, the WSDOT Standard Plans and the WSDOT Traffic Manual. All of the current striping and signing text guidelines (aka S&S guidelines) have been assembled and placed in a new section of the RedBook entitled "Section F, 3rd Edition of the NWR Traffic Operations RedBook". The previous S&S guidelines have been issued on a limited basis, whereas the new section will be distributed on a region wide basis.

The NWR Traffic Engineer approved some of the old guidelines, while others were still in draft form. All of the current guidelines have been updated to reflect changes in the Traffic Manual and the Millennium Edition of the MUTCD. As a result of the updating, all of the S&S guidelines are noted as being in draft form with the revision date of April 15, 2002.

Please remember that the S&S guidelines are dynamic and additions, deletions and revisions to the guidelines will be an on-going process.

These guidelines will be accessible in an electronic "read-only" format in the near future.

The RedBook is currently undergoing a major formatting revision. The main purpose of the RedBook revision is to assemble all of the various striping and signing guidelines, practices, inventories, demonstration projects, etc. in one central location that is accessible by anyone wishing to review that information.

The revision work will be incorporated into Edition #3 over a period of time. The current time frame for completion of the various sections of the RedBook is as follows:

Sections A to D (NWR Pavement Marking Group - striping operation information)
Minor revisions to the 2nd Edition of the RedBook should be completed by the Summer 2002 time frame.

Sections E (NWR Pavement Marking Group - striping and signing cost data, performance measure data, etc.)
Revision work should be completed by the June 2002 time frame.

Section F (NWR Traffic Operations – striping and signing [S&S] text guidelines)
Draft Revision dated April 15, 2002, released May 2002.

Sections G and H (NWR Traffic Operations – general purpose/ HOV striping and signing drawings)
Draft Revision dated February 2002, released March 2002.

Section I (NWR Traffic Operations – regional intersection extension line, railroad, school, transit, etc. related striping and signing inventories)
Final inventory assembly should be completed by the late May 2002 time frame.

Section J (NWR Traffic Operations – striping and signing demonstration projects and special before/after studies)
Data is currently being assembled and should be completed by the Summer 2002 time frame.

VVK:vk SectF_cover1.doc

SECTION F – NWR STRIPING AND SIGNING INSTALLATION GUIDELINES AND PRACTICES

(These guidelines will include any Headquarters Traffic striping and signing directives that have not been incorporated into the Traffic Manual or supplemented by a NWR guideline)

Table of Contents F-i

Forward F-iii

Striping -

- Crosswalks F-CW1
- Edge Line Striping at I/S Radius Returns & Curb Areas & Curb Painting F-CP1
- Methyl Methacrylate (MMA) –
  - Flat Line (double spray & extrusion methods) F-MMA1
  - Flat Line (extrusion method only) F-MMA5
  - Inset Lane Line (extrusion method only) F-MMA8
  - Profiled (double spray & extrusion methods) F-MMA12
- No Pass F-NP1
- Railroad Markings & Signing F-RR1

Signing -

- Adopt A Highway (AAH) F-A1
- Anti-Litter Campaign F-A3
- Apple Maggot F-A5
- Banners F-B1
- Bicycle F-B4
- College & University F-C1
- Compression Brake & Unmuffled Compression Brake F-C3
- Deer (Animal) Warning F-D1
- DUI Victim Memorial F-D4
- Farm Machinery F-F1
- Fatality Markers F-F4
- Fire District Boundary & Fire Danger F-F7
- Fire Hydrant F-F9
- Highway Advisory Radio Signs (HARS) & Tourist Information Station (TIS) F-H1
- Indian Reservation F-I1
- Landscape & Vegetation F-L1
- Left Lane Truck Restriction & Keep Right Except to Pass F-L3
- Logo F-L7
- Median Crossover F-M1
- Refuse Station F-R1
- Rideshare F-R3
- Salmon & Fish Related F-S1
- Schools F-S4
- School Flasher Guidelines F-S11

Seat Belt F-S13
Shoulder Driving Restriction F-S15
Special Event F-S17
State Park F-S19
Stream Name (Water Crossing Name) F-S21
Street Name F-S23
Transit and School Bus Stops on State Highways F-T1
Transit Flyer Stop & Direct Access Connection F-T3
Vehicle Odometer Mileage Checking Courses F-V1
Visitor Information Center (VIC) F-V3

Appendix

Headquarters Traffic Section Supplemental Signing Guidelines And Information F-Z

Memo – Supplemental Guide Signs for Cemetery Signs (2-12-98) F-Z1
Memo – Tow Away Zones on Freeways (7-14-99) F-Z2
Memo – Type 1a Signs (1-14-00) F-Z3
Parking Guidelines F-Z6

NWR – Traffic Operations Group
RedBook - Section F

Forward

Section F of the NWR Traffic Operation's RedBook is a compilation of various striping and signing guidelines and practices that have been developed by the NWR Traffic Operations Group to supplement related items found in the MUTCD, the WSDOT Design manual, the WSDOT Standard Plans, the WSDOT Traffic Manual and Headquarters Traffic directives.

These guidelines do not supercede or negate the previously mentioned manuals or directives. The purpose of the NWR Traffic Operation's guidelines and practices is to provide additional information about the subject items and/or customize the guidelines and practices to fit within the conditions found within the NWR.

The NWR Traffic Engineer has previously approved a number of the NWR guidelines and practices, while others were still in draft form. All of these guidelines and practices have been updated to reflect the January 2002 revision of Chapter 2 (signing) of the Traffic Manual and the Millennium Edition of the MUTCD. The NWR guidelines and practices will have to be further updated when the Traffic Manual Chapter 3 (striping) revision is completed along with any further revisions of the MUTCD Millennium Edition. Subsequently, all the Section F guidelines are identified as being in draft form with the revision date of April 15, 2002.

Section F also has an appendix which contains copies of various Headquarters Traffic striping and signing directives that are stand alone directives which the NWR Traffic Group has not issued any supplemented information on.

The Section F guidelines and practices are dynamic. Consequently, additions, deletions and revisions will be an on-going process.

DRAFT

Crosswalks:
Policy, Practice and Striping

Revised 4-15-2002

Overview:

Marked crosswalks serve to guide pedestrians in the proper path. Marked crosswalks should not be considered as safety devices. Studies have shown that more pedestrian accidents occur at marked crosswalks than at unmarked crosswalks. Pedestrians tend to develop a false sense of security when using marked crosswalks. On the other hand, pedestrians seem to exercise more caution when crossing a roadway where crosswalks are not marked. In keeping with the philosophy that marked crosswalks are an aid for directing pedestrians rather than as a safety device, the State normally will install marked crosswalks only at controlled (signalized or stop controlled) intersections, which have significant pedestrian volumes.

The Northwest Region's Traffic Operations Group has assembled this guideline as an aid for its staff to use when assessing the need for installing a marked crosswalk at a specific location.

The guideline is divided into the following sections:

Section A - Warrants for a generic crosswalk installation

Section B - Warrants for a crosswalk installation within an incorporated city or town
Section C - Warrants for a school crosswalk
Section D - Crosswalk installation

Pertinent Laws and Guidelines:
The reader is also referred to the following laws and guidelines for additional information -

RCW 46.61.235 -
Requires motorists to stop for pedestrians in either marked crosswalks or unmarked crosswalks at intersections.

RCW 46.61.240 -
Discusses the responsibility of pedestrians when they cross a road at other than a marked crosswalk or unmarked crosswalk at an intersection.

RCW 46.61.570 -
Requires that a distance of twenty feet each side of the crosswalk shall be clear of any obstruction.

MUTCD 3B-18 -
Crosswalks and crosswalk lines.

MUTCD 4C-5 -
Signal Warrant 3, Minimum Pedestrian Volume
100 pedestrians or more for each of any four hour period; or
190 pedestrians or more during any one-hour period
Volume may be reduced by 50% if predominate pedestrian speed is below 3.5 feet per second
Less than 60 gaps per hour
Suggest curbside parking be prohibited 100 feet in advance and 20 feet beyond a crosswalk

Section A -
Warrants for a generic crosswalk installation

The Northwest Region (NWR) generally installs crosswalks only at controlled intersections. Controlled intersections are defined as signalized controlled or stop sign controlled. The NWR will not install crosswalks at "free right turn" areas or at mid-block locations, unless an engineering study supports such a decision. The engineering study would include accident evaluation, pedestrian demand, roadway conditions, direct route, consideration of alternate route, etc.

The standard number of crosswalks for a "T" intersection should be 3. The standard number of crosswalks for a "Four Legged" intersection should be 4. At signalized crosswalks this will include all necessary displays and detection systems. The minimum number of striped crosswalks, including displays and detection, at signalized intersections, is 2 for "T" intersections and 3 for "Four Legged" intersections. (Pedestrian crossing prohibition signs shall be installed on the legs that are not marked.) Typically, for a "T" intersection, the crosswalk should be installed across the mainline leg that receives

right turning traffic from the stem of the "T". Any leg controlled by a stop sign is an acceptable location for a crosswalk; however, they are typically not striped with a crosswalk unless there is significant pedestrian activity in the area.

If a crosswalk is requested at an uncontrolled location, the following criteria will have to be satisfied before the crosswalk location can be approved:

A-1. A crosswalk ***may*** be installed if all of the following conditions are met:

- The operating speed limit on the highway is 45 mph or lower. Marked crosswalks should not typically be used at remote locations where the operating speed exceeds 35 mph and is not located at a controlled intersection.

Note: Placement of crosswalks will be predicated upon the operating speed of a highway. The operating speed is also known as the 85-percentile speed. If the operating speed is not known, then the posted speed may be used.

- There is adequate stopping sight distance as defined by Tables III-1 and III-2 in the AASHTO green book.

- There is adequate illumination or the potential to install it. Illumination of marked crosswalks is normally provided when pedestrian volumes meet the criteria in MUTCD Section 4C-5. When markings are requested by others and volumes do not meet those requirements, funding and power for crosswalk lighting is normally provided by the requester.

- The volume criteria in Item A-2 is met.

and either

- The criteria listed in Item A-3 for roadway conditions

or

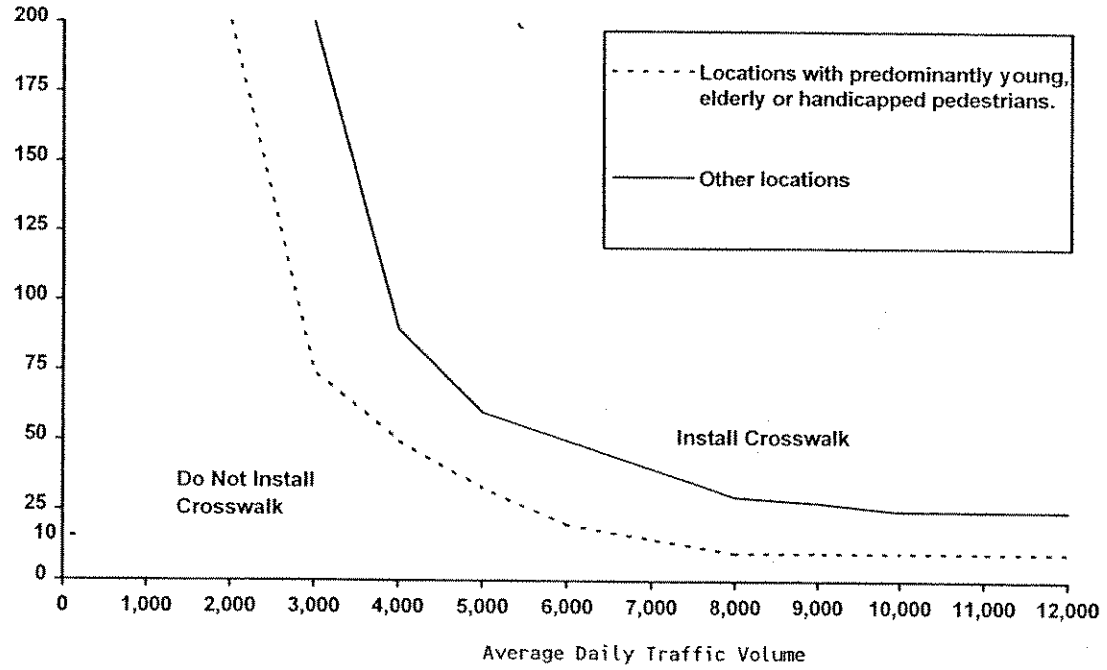
- The criteria listed in A-4 for a non-stop controlled right turn lane is met.

A-2. Pedestrian/Vehicle Volume Criteria:

- The hourly pedestrian volume warrant shall be met for any four hour period of a typical Monday through Friday weekday.

- The conditions which lead to the pedestrian volumes being present shall be in effect for at least 6 months of the year.

- Vehicle volumes are based on Annual Average Daily Traffic.



A-3. Roadway Conditions:

- A pedestrian shall be forced to cross only two lanes of traffic before being given a refuge, i.e., crossings of three lanes of traffic in the same direction is not allowed. Left, Right, and TWLT lanes are each considered as a lane of traffic.

- The refuge, normally in the median area, shall be an ADA compatible raised island. This may result in an island being split by an at-grade crossing path.

- Shoulder (or sidewalk/curb) bulbs to decrease the crossing distance may be considered as an option for decreasing the roadway width that a pedestrian has to cross.

- There is overhead, internally illuminated signing supported by standard approach signing.

- Spacing minimums to the closest nearby crossing opportunity are met. A crossing opportunity is defined to be a signalized crossing or an all-way stop controlled intersection. Minimum spacing is defined to be no closer than 600' in a rural setting and 300' in an urban setting.

A-4. Non-stop controlled right turn lane criteria:

- The turn lane shall depart from the through lane by a maximum 20° taper, with as tight a radius as possible on the entry to cross street.

- There shall be a clear line of sight from the vehicle to a pedestrian standing on a sidewalk, walkway or shoulder area at the inside of the curve. The line of sight distance should meet the MUTCD stopping sight distance criteria.

- The turn lane shall be required to meet the pedestrian/vehicle volume criteria as listed in A-2.

Section B -
Warrants For A Crosswalk Installation Within An Incorporated City Or Town

Incorporated cities or towns having a population of 22,500 or more are responsible for the highway striping and pavement markings within their jurisdictions.

For cities or towns having a population of 22,500 or less, the state is responsible for the highway striping and pavement markings within their jurisdictions.

B-1. The NWR may install and maintain crosswalks within a particular incorporated city or town (under 22,500) using that agency's crosswalk standards, if the local agency has a crosswalk policy that is in conformance to the MUTCD and is in general agreement with ours. The local agency should submit a written request to us along with an ordinance and/or its engineering crosswalk standard.

a. Marked crosswalks at non-controlled intersections must still meet the criteria listed in Item A-1.

b. The city may maintain the crosswalk striping, if it wishes and the agreement is in writing such as under the NWR - Traffic Operation Group's Striping Memorandum of Understanding. However, the State will not reimburse the city for any striping costs incurred by the city.

B-2. Where the warrants may be marginally met, the state may agree to install a marked crosswalk, if the local agency agrees that the marked crosswalk shall be removed if more pedestrian accidents occur after installation than before. The statistical comparison will be made on the basis of pedestrian accidents (and/or pedestrian accident rate per million vehicles) entering the crosswalk per year. The nominal before/after comparison should be at least 1 year in length.

B-3. The State will mark the crosswalk and install the appropriate shoulder mounted pedestrian signs per the Manual on Uniform Traffic Control Devices (MUTCD). Maintenance of these traffic control devices shall be the State's responsibility. Any supplemental signs or devices (such as flashers) may be installed by the city or town, if approved by the State. Any and all costs for said supplemental signs or devices shall be the responsibility of the city or town.

B-4. In 1995 the NWR initiated a policy of not restriping crosswalks at non-controlled locations. Prior to 1995, the NWR did install several marked crosswalks at non-controlled locations. The NWR also accepted the responsibility of maintaining marked crosswalks at non-controlled locations through "route jurisdiction transfers". The NWR has felt that it would be inappropriate to continue this practice since it does not follow our basic guideline philosophy.

However, if an incorporated city or town (under 22,500) makes a formal request to continue the maintenance of a marked crosswalk at a non-controlled location and submits a crosswalk ordinance, the NWR may continue to maintain the crosswalk, provided that no pedestrian related accidents have occurred at the crosswalk location for the last 3 years. Continuation of the crosswalk maintenance would be contingent upon no pedestrian related accidents occurring at that crosswalk.

Section C - Warrants For A School Crosswalk

A marked crosswalk may be installed on a State highway if :

C-1. The crossing is on an established school route (approved school route plan).

C-2. The school district agrees to station a crossing guard at the crosswalk when it is being used by students.

C-3. The local enforcement agency commits to enforcing the school speed limit of 20 MPH.

The State will be responsible for the design, installation, operation, and maintenance of all signs, pavement markings, and control equipment, exclusive of any overhead sign and flashing lights, which would be the responsibility of the school district.

Section D - Crosswalk Installation (Striping)

The current statewide crosswalk striping standard is the 24-inch piano key layout as shown in the Standard Plans and the NWR – Traffic Operations RedBook Crosswalk Drawing Detail.

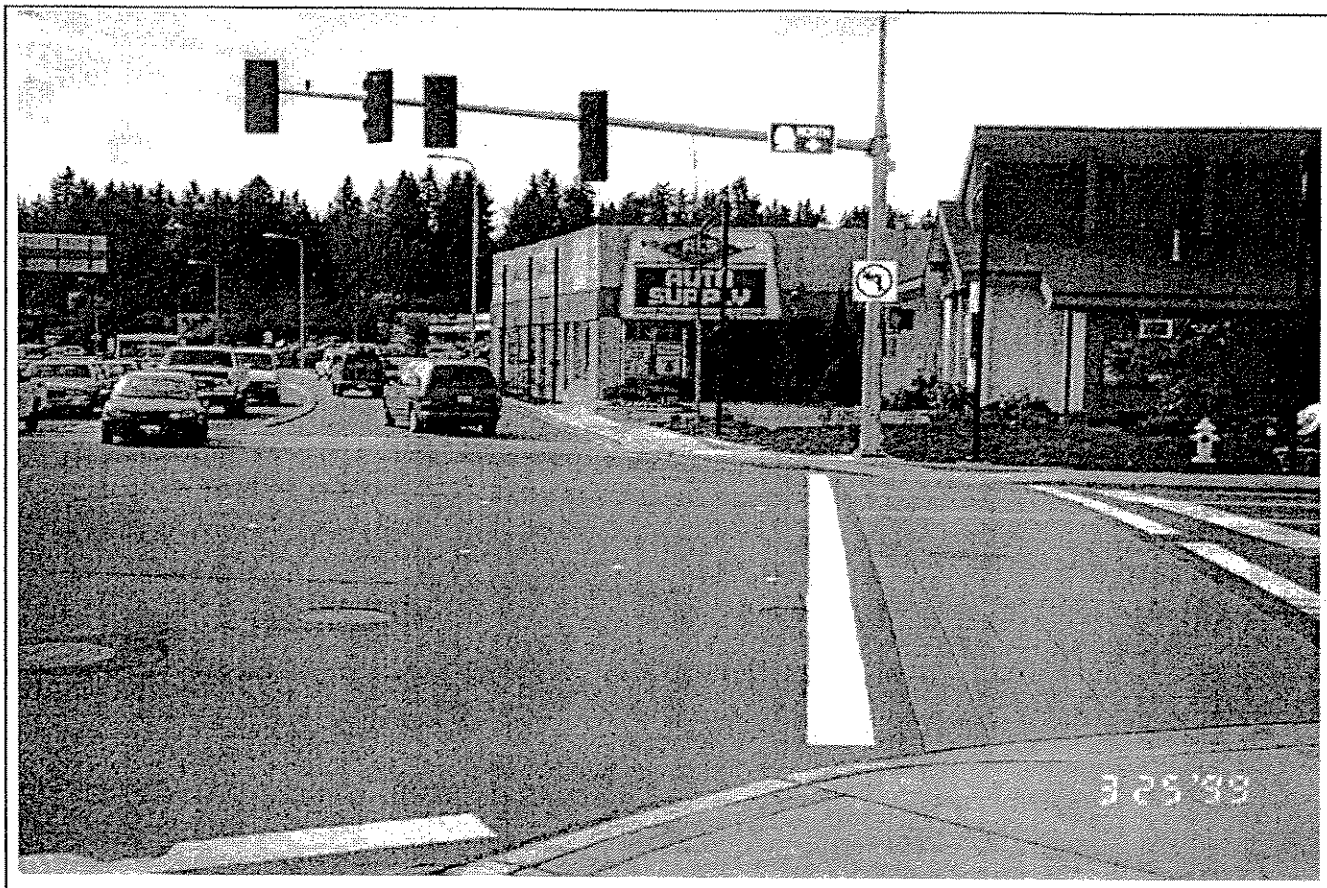
- All new crosswalks must be the 24-inch piano key style layout.

- When upgrading a transverse crosswalk layout to the piano key layout **all of the transverse markings must be removed**. Installing the 24-inch piano key layout without removing the transverse markings presents an unprofessional striping installation to the public. General public comment has been to remove all of the old transverse markings or refresh the transverse markings to create a ladder layout, which we will not do.

- In incorporated cities or towns, transverse crosswalk markings may remain in place if the agency requests the retention of the transverse crosswalk layout in writing and a subsequent agreement is made with that agency.

  Please note that very few agreements have been made and most of the local agencies are now using either the 8/8/8 inch or 24-inch piano key layouts for added crosswalk emphasis.

  Some local jurisdictions are doing crosswalk beautification enhancements such as marking out the crosswalk areas with bricks, brick texturing outlines, special crosswalk area visibility colors, etc. Based upon complaints received about the brick and brick texturing usages, we strongly advise that transverse crosswalk lines still be used to outline the brick or brick textured areas for added emphasis. Please see the picture below for an example of a brick texture crosswalk area outlined with transverse crosswalk striping.



- Existing 8/8/8 inch piano key layouts should be upgraded to the 24-inch piano key layouts when the crosswalks are being refreshed. The existing 8-inch pattern can be rehabilitated by filling in the eight gap between the two 8 inch lines to make a 24-inch width line.

- Existing 12/12/12 inch piano key layouts should be upgraded to the 24-inch piano key layout when the crosswalks are being refreshed.

- All mid-block crosswalks ***must*** use the 24-inch width pattern.

- Methyl methacrylate (MMA) should be the only durable marking material used to stripe crosswalks. The service life of MMA is normally around 5 to 7 years.

  Thermoplastic may be considered only as second choice if there is sufficient justification for not using MMA. Thermoplastic presents more of a slippery surface to pedestrians, bicyclists and motorcyclists and should not be used for that reason. The service life of thermoplastic is between 2 to 3 years.

  Solvent base paint is not normally used for painting crosswalks as its service life is usually less than one year. Solvent base paint may be used only if the crosswalk area was going to be revised within one year or less due to an overlay project, widening project, etc.

- The NWR Pavement Marking Group refreshes crosswalk striping on a 2 to 5 year cycle depending on the type of striping material used and the amount of traffic wear encountered. Crosswalks are normally refreshed only if 50% or more of its lines have been worn off.

- An 18-inch wide stop bar will always be used in conjunction with marked crosswalks at intersections. The location of a stop bar is in relationship to the turning path of a vehicle turning left from/to the adjacent street and not to the crosswalk itself. The stop bar is normally set back a minimum of four feet and a maximum of 30 feet from the crosswalk.

  Stop bars are not normally installed at midblock crossings. However, they may be considered at school mid-block crossings, if additional safety considerations are warranted.

VVK:vk RB_F_xwalk1.doc

DRAFT

Edge Line Striping At Intersection Radius Returns and Curb Areas; And Curb Painting

Revised 4-15-2002

Forward:

The NWR Traffic Operations Group has received numerous comments and complaints from the public about how we stripe edge lines at intersection radius returns, at curb areas and the painting of the curb sections themselves. From the 1996 time frame onward the NWR Traffic Operations Group has initiated different approaches in how, when and where edge line striping at intersection radius return areas, curb areas and curb face painting will be done. The public response has been positive for the continuation of these new procedures, especially the radius return striping. The procedures have now been made part of the NWR Traffic Operations RedBook guidelines.

Definition -

Curb painting - The painting of any portion of a curb, which could include the front face of a curb and the top of a curb. Curb painting will replace the term 'curb striping' in order to eliminate any confusion with the term 'edge line striping'.

NWR – Traffic Operations Supplemental Guidelines:

- All intersection radius returns will be striped in MMA durable marking material (thermoplastic is an acceptable alternate).
  The goal is to stripe all rural intersection radius returns and then urban intersection radius returns as time permits.

- A major change from previous policy will be the striping of an edge line in front of curb sections wherever sufficient roadway width permits such striping. The goal is to provide shy distance between the travel lane and any adjacent curb section as an aid in reducing curb related accidents, especially during nighttime and inclement weather conditions.

  Edge line striping will be continuous through curb sections, if the adjacent lane widths permit such striping. The amount of shy distance will depend upon the available lane width as follows:

Median or centerline curb section –

1-1/2 foot shy from curb face, if the adjacent lane width is 12 feet or greater.
1 foot shy from curb face, if the adjacent lane width is between 10.5 and 12 feet.
No shy, if the adjacent lane width is less than 10.5 feet. The curb face must be striped each year.

Right side curb and raised island sections –

4 foot shy from curb face, if there is heavy bicycle usage and the adjacent lane width will permit this shy distance striping.
3 foot shy from curb face, if the adjacent lane width is14 feet or greater.
1-1/2 foot shy from curb face, if the adjacent lane width is 12 to 14 feet.
1 foot shy from curb face, if the adjacent lane width is 11 to 12 feet.
No shy, if the adjacent lane width is less than 11 feet.
NOTE: If there is a concrete gutter section, consider placing an edge line on the ACP side of the gutter line. Gutter widths are usually either 12 or 18 inches in width.

- There shall be no breaks in the edge lines at parking areas, especially angle parking areas.

- There shall be no breaks at private driveways unless the driveway has been built to intersection design standards, such as shopping mall driveways that have radius returns vs. depressed sidewalk sections.

- Unincorporated areas -
  WSDOT is responsible for any curb painting. Median curbing with no edge line should be painted every year. Island curbing with no edge line should be painted every year. Right side curbing with no edge line is not normally painted unless a safety or parking restriction exists.

- Incorporated cities or towns (under 22,500) -
  WSDOT will be responsible for any median or island curb painted as mention in the above bullet item.

  The local agency would normally be responsible for any right side curb painting.

- Curb colors –
  All median and centerline curbing shall be painted yellow.

  Per Revision No. 6 (February 2002) to Section H of the RedBook, all island curbing should be painted white. Past practice was to paint any left side island curbing 'yellow'. The NWR Traffic Manager has rescinded that practice.

  If right side curbing is painted it should only be painted 'white' if the purpose is to alert motorists to its existence. The color 'yellow' should not be used. Painting right side curbing 'yellow' is not in conformance to the MUTCD and standard striping conventions.

  Right side curbing can be painted 'red' if the area is a restricted area, such as a no parking area.

Local transit agencies and/or the local jurisdiction may paint any transit/bus pullout area in specific transit related colors, if the transit agency and/or local jurisdiction agrees to maintain such striping.

- K-Curb striping –
  All K-Curb installations shall be painted at the time of construction.

  If the curbing is three foot or less in width, the entire curb shall be painted 'white'. If the curbing is greater than three feet, the entire curb can still be painted "white" or just the curb face and the first 6 inches on top of both sides of the curb section.

  K-Curb maintenance will be the responsibility of the property owner on the private property side. Maintenance painting of the K-Curb on the highway side will be done by WSDOT on a case-by-case basis as time permits and safety dictates.

  If the K-Curb has been placed to act as parking restriction, the highway side can be painted in 'red'. The curb section should be first completely painted in 'white' in order to provide contrast and then the front curb face and top first 6 inches painted in 'red'.

VVK:vk RB_F_CurbStriping1.doc

DRAFT

Methyl Methacrylate (MMA) Flat Line Specification

(double spray and extrusion methods)

OSC File – 10-8-1999 MMA99.1E

NWR – Publication Date 4-15-2002

Scope:
This specification describes methyl methacrylate flat line markings that can be applied by the double spray or the extrusion methods.

PAVEMENT MARKING

Materials.
Section 8-22.2 is replaced with the following:

Paint for pavement marking material shall be selected from the Qualified Products List. Paint shall be applied with a top dressing of glass beads.

Plastic pavement markings, including ********** (*Fill in types of markings*) for this project shall consist of methyl methacrylate pavement marking material. The pavement marking material shall be a two-component system for application on asphalt or portland cement pavements. Methyl methacrylate pavement marking material applications are as follows:

1. Type 1 Material. Type 1 material is formulated to be applied by hand operated extrusion device, pouring or hand trowel. This material is used for letters, transverse markings, long line flat markings, inset markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.
2. Type 3 Material. Type 3 material is formulated to be applied using the extrusion method with motor driven application equipment. This material is used for long line markings. The material contains intermixed glass beads and an abrasive material for skid resistance.
3. Type 4 Material. Type 4 material is formulated to be applied using the hand spray method. This material is used for letters, transverse markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.
4. Type 5 Material. Type 5 material is formulated to be applied using the spray method with motor driven application equipment. The material is used for long line markings. The material does not contain intermixed glass beads or abrasive material. Glass beads and abrasive material are injected into the spray stream at the point of application.

The equipment used for spray applications shall be designed for properly mixing the components at the point and time of application.

The material shall be composed of resins, reactive monomers and pigments. The material shall cure to 99% minimum weight and volume solids.

The material shall have the following performance characteristics:

1. Viscosity
   - Type 1 Material: 11,000-15,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 3 Material: 17,000-21,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 4 Material: 8,000-10,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 60 RPM).
   - Type 5 Material: White 5,000-8,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 600 RPM).
   - Type 5 Material: Yellow 7,000-11,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 60 RPM).
2. Component Mix
   - Type 1 Material: One gallon "A" (methyl methacrylate) and 3 fluid ounces "B" (benzoyl peroxide powder).
   - Type 3, 4 and 5 Material: Four parts "A" (methyl methacrylate) and one part "B" (liquid benzoyl peroxide).
3. No Track Time: 15 minutes after application at 40 mils (ASTM D711).
4. Hardness: Shore Durometer Type D, 55 minimum after 24 hours.
5. Tensile Strength: 125 psi min. at break (ASTM D638).
6. Elongation: 20% min. (ASTM D638).
7. Water Absorption: 0.5% max. (ASTM D570).
8. Chemical Resistance: The material shall show no effect after seven-day immersion in anti-freeze, motor oil, diesel fuel, gasoline, calcium chloride, sodium chloride or transmission fluid.
9. Ultra-violet Light: Ultra-violet light shall have no effect.
10. Adhesion: 200 psi on portland cement concrete, substrate failure on asphalt concrete cement.
11. Skid Resistance: 45 British Pendulum Units, minimum, (ASTM E303).

Type 1, 3 and 4 pavement marking material shall be intermixed with a manufacturer approved abrasive material (2-4 #/gal.) to achieve skid resistance requirements.

The Contractor shall provide to the Engineer a manufacturer's warranty for the methyl methacrylate pavement marking material. The warranty shall state that the manufacturer will repair or replace (at WSDOT's discretion) any material that fails within a period of 4 years. Failure is defined as any of the following:

1. The material fails to adhere to the substrate. Adherence failure is defined as a cumulative loss of line greater than 5% of any 300-foot length of pavement marking line.
2. The material reflectivity falls below 150 millicandellas per lux per meter squared for white material or 125 millicandelas per lux per meter squared for yellow material. Reflectivity failure is defined as a cumulative failure of reflectivity greater than 5% of any 300-foot length of pavement marking line.
3. The material discolors significantly.

The warranty period will start on the date the Engineer accepts the work. Reflectivity failure will be determined by using a Mirolux 12 or similar device. Cleaning of the markings is not allowed prior to reflectivity determination. The manufacturer shall repair or replace the material within 6 months of the date of the request to repair or replace the material.

Construction Requirements

Preliminary Spotting
Section 8-22.3(1) is supplemented with the following:

The Contractor shall be responsible for providing a thin painted work line transferred from the control points provided by the Engineer. The control points will be provided at a spacing of 100-feet on tangents and 25-feet on curves on centerline only. The color of the work line shall match the color of the permanent lane or edge stripe. The painted work line shall be applied at a maximum of 4 mils thickness and shall have a maximum width of 2 inches.

Preparation of Roadway Surfaces
Section 8-22.3(2) is supplemented with the following:

New dense asphalt concrete pavement shall be allowed to cure a minimum of 14 days before the pavement marking material is applied. New open graded asphalt concrete pavement shall be allowed to cure a minimum of 28 days before the pavement marking material is applied. The methyl methacrylate pavement marking material shall be applied in accordance with the manufacturer's recommendations. Pavement surfaces shall be clean and dry for at least 24 hours, free from contaminants such as curing agents, surface oils or existing road marking materials prior to application of the pavement marking material. Contaminants shall be removed by approved mechanical means, such as shot blasting, turbo blasting or grinding. Installation on coal tar based asphalt is not allowed. The surface temperature shall be between 40° F and 105° F.

Paint Application
Section 8-22.3(3) is supplemented with the following:

Extruded pavement marking material shall be applied at a thickness of 90 mils. (*Change thickness to 120 mils for open graded asphalt applications*)

Sprayed pavement marking material shall be applied to achieve a finished thickness of 90 mils. If Type 5 pavement marking material is selected, two applications at 45 mils are required. (*Change thickness to 120 mils for extruded applications or two applications at a thickness of 60 mils sprayed for open graded asphalt applications*)

Maximum coverage per gallon of methyl methacrylate pavement marking material shall be as follows:

Thickness (mils)	Area (Sq.Ft.)	4" Edge Line (Ft.)
45	36.6	107
60	27.3	82
90	17.8	54
120	13.6	41

Beading
The first paragraph of Section 8-22.3(4) is replaced with the following:

Glass beads shall comply with AASHTO Standard Specification M 247-81, Type 1.

Intermixed and drop-on beads for Type 1, 3, and 4 materials shall be treated with a saline coating to enhance adherence to the pavement marking material. The material shall contain 4 pounds per gallon of intermixed beads. The drop-on beads shall be applied at a rate of 6 pounds per 100 square feet.

Type 5 material requires two coats and a two-bead gun system for bead and anti-skid aggregate application. The lead bead gun shall apply the aggregate and beads on the first application. The bead application rate shall be 8 pounds per gallon and the aggregate shall be applied at a rate of 2-5 pounds per gallon. The first application beads (sinkers) shall be treated with a saline coating to enhance adherence with the pavement marking material. The second bead gun shall be turned off during the first coat application.

The first application shall be allowed to cure a minimum of 1 hour and a maximum of 4 hours. Loose beads, debris and dirt shall be swept off or blown off prior to application of the second application.

For the second coat, the lead gun shall apply sinker beads and aggregate at the same rate as the first application. The second gun shall apply drop-on beads with a coating to provide bisymmetrical positioning of the beads (floaters) on the surface of the material at a rate of 5 pounds per gallon.

DRAFT

Methyl Methacrylate (MMA) Flat Line Specification

(extrusion method only)

OSC File – 10-8-1999 MMA99.2E

NWR – Publication Date 4-15-2002

Scope:
This specification describes methyl methacrylate flat line markings that can be applied by the extruded method. Long-line application done by the double spray method is not allowed per this specification.

PAVEMENT MARKING

Materials.
Section 8-22.2 is replaced with the following:

Paint for pavement marking material shall be selected from the Qualified Products List. Paint shall be applied with a top dressing of glass beads.

Plastic pavement markings, including ********** (*Fill in types of markings*) for this project shall consist of methyl methacrylate pavement marking material. The pavement marking material shall be a two-component system for application on asphalt or portland cement pavements. Methyl methacrylate pavement marking material applications are as follows:

1. Type 1 Material. Type 1 material is formulated to be applied by hand operated extrusion device, pouring or hand trowel. This material is used for letters, transverse markings, long line flat markings, inset markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.
2. Type 3 Material. Type 3 material is formulated to be applied using the extrusion method with motor driven application equipment. This material is used for long line markings. The material contains intermixed glass beads and an abrasive material for skid resistance.
3. Type 4 Material. Type 4 material is formulated to be applied using the hand spray method. This material is used for letters, transverse markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.

The equipment used for spray applications shall be designed for properly mixing the components at the point and time of application.

The material shall be composed of resins, reactive monomers and pigments. The material shall cure to 99% minimum weight and volume solids.

The material shall have the following performance characteristics:

1. Viscosity

   Type 1 Material: 11,000-15,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).

   Type 3 Material: 17,000-21,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).

   Type 4 Material: 8,000-10,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 50 RPM).
2. Component Mix

   Type 1 Material: One gallon "A" (methyl methacrylate) and 3 ounces "B" (benzoyl peroxide powder).

   Type 3, and 4 Material: Four parts "A" (methyl methacrylate) and one part "B" (liquid benzoyl peroxide).
3. No Track Time: 15 minutes after application at 40 mils (ASTM D711).
4. Hardness: Shore Durometer Type D, 55 minimum after 24 hours.
5. Tensile Strength: 125 psi min. at break (ASTM D638).
6. Elongation: 20% min. (ASTM D638).
7. Water Absorption: 0.5% max. (ASTM D570).
8. Chemical Resistance: The material shall show no effect after seven-day immersion in anti-freeze, motor oil, diesel fuel, gasoline, calcium chloride, sodium chloride or transmission fluid.
9. Ultra-violet Light: Ultra-violet light shall have no effect.
10. Adhesion: 200 psi on portland cement concrete, substrate failure on asphalt concrete cement.
11. Skid Resistance: 45 British Pendulum Units, minimum, (ASTM E303).

Type 1, 3 and 4 pavement marking material shall be intermixed with a manufacturer approved abrasive material (2-4 #/gal.) to achieve skid resistance requirements.

The Contractor shall provide to the Engineer a manufacturer's warranty for the methyl methacrylate pavement marking material. The warranty shall state that the manufacturer will repair or replace (at WSDOT's discretion) any material that fails within a period of 4 years. Failure is defined as any of the following:

1. The material fails to adhere to the substrate. Adherence failure is defined as a cumulative loss of line greater than 5% of any 300-foot length of pavement marking line.
2. The material reflectivity falls below 150 millicandellas per lux per meter squared for white material or 125 millicandelas per lux per meter squared for yellow material. Reflectivity failure is defined as a cumulative failure of reflectivity greater than 5% of any 300-foot length of pavement marking line.
3. The material discolors significantly.

The warranty period will start on the date the Engineer accepts the work. Reflectivity failure will be determined by using a Mirolux 12 or similar device. Cleaning of the markings is not allowed prior to reflectivity determination. The manufacturer shall repair or replace the material within 6 months of the date of the request to repair or replace the material.

Construction Requirements

Preparation of Roadway Surfaces

Section 8-22.3(2) is supplemented with the following:

New dense asphalt concrete pavement shall be allowed to cure a minimum of 14 days before the pavement marking material is applied. New open graded asphalt concrete pavement shall be allowed to cure a minimum of 28 days before the pavement marking material is applied. The methyl methacrylate pavement marking material shall be applied in accordance with the manufacturer's recommendations. Pavement surfaces shall be clean and dry for at least 24 hours, free from contaminants such as curing agents, surface oils or existing road marking materials prior to application of the pavement marking material. Contaminants shall be removed by approved mechanical means, such as shot blasting, turbo blasting or grinding. Installation on coal tar based asphalt is not allowed. The surface temperature shall be between 40° F and 105° F.

Paint Application

Section 8-22.3(3) is supplemented with the following:

Extruded pavement marking material shall be applied at a thickness of 90 mils. (*Change thickness to 120 mils for open graded asphalt applications*)

Sprayed pavement marking material shall be applied to achieve a finished thickness of 90 mils. (*Change thickness to 120 mils for open graded asphalt applications*)

Maximum coverage per gallon of methyl methacrylate pavement marking material shall be as follows:

Thickness (mils)	Area (Sq.Ft.)	4" Edge Line (Ft.)
90	17.8	54
120	13.6	41

Beading

Section 8-22.3(4) is supplemented with the following:

Glass beads for methyl methacrylate pavement marking material shall comply with AASHTO Standard Specification M 247-81, Type 1. Intermixed and drop-on beads for Type 1, 3, and 4 material shall be treated with a silane coating to enhance adherence to the pavement marking material. The material shall contain 4 pounds per gallon of intermixed beads and the drop on beads shall be applied at a rate of 6 pounds per 100 square feet.

DRAFT

Methyl Methacrylate (MMA) Inset Lane Line Specification

(extrusion method only)

OSC File – 10-8-1999 MMA99.5E NWR – Publication Date 4-15-2002

Scope:
This specification describes methyl methacrylate inset lane markings applied by the extrusion method.

This specification also includes the spray method application for pavement markings.

PAVEMENT MARKING

Description
Section 8-22.1 is supplemented with the following:

Inset Lane Stripe
A BROKEN or "skip" white line, 4.1 to 4.2 inches wide, used to delineate adjacent lanes traveling in the same direction. The skip pattern shall be based on a 40-foot unit consisting of a 10-foot line and a 30-foot gap.

Materials.
Section 8-22.2 is replaced with the following:

Paint for pavement marking material shall be selected from the Qualified Products List. Paint shall be applied with a top dressing of glass beads.

Plastic pavement markings and inset pavement markings, including ********** (*Fill in types of markings*) for this project shall consist of methyl methacrylate pavement marking material. Inset lane stripe for this project shall consist of methyl methacrylate pavement marking material applied in a groove that has been ground into the pavement. The pavement marking material shall be a two-component system for application on asphalt or portland cement pavements.
Methyl methacrylate pavement marking material applications are as follows:

1. Type 1 Material. Type 1 material is formulated to be applied by hand operated extrusion device, pouring or hand trowel. This material is used for letters, transverse markings, long line flat markings, inset markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.

2. Type 3 Material. Type 3 material is formulated to be applied using the extrusion method with motor driven application equipment. This material is used for long line markings. The material contains intermixed glass beads and an abrasive material for skid resistance.
3. Type 4 Material. Type 4 material is formulated to be applied using the hand spray method. This material is used for letters, transverse markings and symbols. The material contains intermixed glass beads

The equipment used for spray applications shall be designed for properly mixing the components at the point and time of application.

The material shall be composed of resins, reactive monomers and pigments. The material shall cure to 99% minimum weight and volume solids.

The material shall have the following performance characteristics:

1. Viscosity
   - Type 1 Material: 11,000-15,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 3 Material: 17,000-21,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 4 Material: 8,000-10,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 50 RPM).
2. Component Mix
   - Type 1 Material: One gallon "A" (methyl methacrylate) and 3 ounces "B" (benzoy peroxide powder).
   - Type 3, and 4 Material: Four parts "A" (methyl methacrylate) and one part "B" (liquid benzoyl peroxide).
3. No Track Time: 15 minutes after application at 40 mils (ASTM D711).
4. Hardness: Shore Durometer Type D, 55 minimum after 24 hours.
5. Tensile Strength: 125 psi min. at break (ASTM D638).
6. Elongation: 20% min. (ASTM D638).
7. Water Absorption: 0.5% max. (ASTM D570).
8. Chemical Resistance: The material shall show no effect after seven-day immersion in anti-freeze, motor oil, diesel fuel, gasoline, calcium chloride, sodium chloride or transmission fluid.
9. Ultra-violet Light: Ultra-violet light shall have no effect.
10. Adhesion: 200 psi on portland cement concrete, substrate failure on asphalt concrete cement.
11. Skid Resistance: 45 British Pendulum Units, minimum, (ASTM E303).

Type 1, 3 and 4 pavement marking material shall be intermixed with a manufacturer approved abrasive material (2-4 #/gal.) to achieve skid resistance requirements.

The Contractor shall provide to the Engineer a manufacturer's warranty for the methyl methacrylate pavement marking material. The warranty shall state that the manufacturer will repair or replace (at WSDOT's discretion) any material that fails within a period of 4 years. Failure is defined as any of the following:

1. The material fails to adhere to the substrate. Adherence failure is defined as a cumulative loss of line greater than 5% in any 300-foot length of pavement marking line.

2. The material reflectivity falls below 150 millicandellas per lux per meters squared for white material or 125 millicandelas per lux per meters squared for yellow material. Reflectivity failure is defined as a cumulative failure of reflectivity greater than 5% of any 300-foot length of pavement marking line.
3. The material discolors significantly.

The warranty period will start on the date the Engineer accepts the work. Reflectivity failure will be determined by using a Mirolux 12 or similar device. Cleaning of the markings is not allowed prior to reflectivity determination. If the material fails within the 4-year period, the manufacturer shall repair or replace the material within 6 months of the date of the request to repair or replace the material.

Construction Requirements

Preliminary Spotting

The Contractor shall be responsible for providing a thin painted work line transferred from the control points provided by the Engineer. The control points will be provided at a spacing of 100-feet on tangents and 25-feet on curves on centerline only. The color of the work lien shall match the color of the permanent lane or edge stripe. The painted work line shall be applied at a maximum of 4 mils thickness and shall have a maximum width of 2 inches.

Preparation of Roadway Surfaces

Section 8-22.3(2) is supplemented with the following:

New dense asphalt concrete pavement shall be allowed to cure a minimum of 14 days before the pavement marking material is applied. New open graded asphalt concrete pavement shall be allowed to cure a minimum of 28 days before the pavement marking material is applied. The methyl methacrylate pavement marking material shall be applied in accordance with the manufacturer's recommendations. The pavement grinds for the inset pavement marking material shall be cut with a diamond grinder and shall be a minimum of 250 mils deep, 4 inches wide and 10-foot long. The grinds shall be a smooth, square slot.

Pavement surfaces, including the bottom surface of the inset grind, that are to receive pavement marking shall be clean and dry for at least 24 hours, free from contaminants such as curing agents, surface oils or existing road marking materials prior to application of the pavement marking material. Contaminants shall be removed by approved mechanical means, such as shot blasting, blasting or grinding. All inset applications shall be shot blasted and shall be free from water or moisture for a minimum of 48 hours prior to shot blasting. Installation on coal tar based asphalt is not allowed. The surface temperature shall be between 40° F and 105° F.

Paint Application

Section 8-22.3(3) is supplemented with the following:

Type 1 or Type 4 pavement marking material shall be applied at a thickness of 90 mils for surface applied markings including: crosswalk stripe, stop bar, traffic arrows, traffic letters, all symbols and drainage markings. (*Change thickness to 120 mils for open graded asphalt applications*)

Type 3 pavement marking material for flat line surface applications shall be applied to achieve a finished thickness of 90 mils for flat line longitudinal markings. (*Change thickness to 120 mils for graded asphalt applications*)

Type 1 or Type 3 pavement marking material shall be used for inset lane lines and shall be applied at a thickness of 260 mils minimum to fill the grind 10-15 mils above the top of the pavement surface. The inset shall be filled with pavement marking material so that all edges are overfilled by 0.1-0.2 inches, resulting in a line width of 4.1-4.2 inches.

Maximum coverage per gallon of methyl methacrylate pavement marking material shall be as follows:

Thickness (mils)	Area (Sq Ft.)	4.1-inch wide line (Ft.)
90 mil flat line	17.9	53.7
120 mil flat line	13.4	40.3
260 mil insets	6.2	18.6

Beading
Section 8-22.3(4) is supplemented with the following:

Glass beads for methyl methacrylate pavement marking material shall comply with AASHTO Standard Specification M 247-81, Type 1. Intermixed and drop-on beads for Type 1, 3 and 4 material shall be treated with a silane coating to enhance adherence to the pavement marking material. The material shall contain 4 pounds per gallon of intermixed beads and the drop on beads shall be applied at a rate of 6 pounds per 100 square feet.

Measurement
Section 8-22.4 is supplemented with the following:

Inset lane stripe will be measured by the completed linear foot. No deduction will be made for the unstriped gap between inset lane stripes.

Payment
Section 8-22,5 is supplemented with the following:

"Inset Lane Stripe", per foot.

BB:vk RB_F_Mma995.doc

DRAFT

Methyl Methacrylate (MMA) Profiled Line Specification

(double spray and extrusion methods)

OSC File – 10-8-1999 MMA99.3E NWR – Publication Date 4-15-2002

Scope:
This specification describes extruded methyl methacrylate flat line, profiled lane line, profiled drop lane line and profiled gore lane line longitudinal markings.

This specification also includes the double spray method for non-profiled lane line striping.

PAVEMENT MARKING

Description
Section 8-22.1 is supplemented with the following:

Profiled Skip Center Stripe
A BROKEN YELLOW line 4 inches wide. The broken or "skip" pattern shall be based on a 40-foot unit consisting of a 10-foot line and a 30-foot gap. Skip center stripe is used as centerline delineation on two lane or three lane, two-way highways. Profiled skip center stripe has five profiles or "bumps" spaced every 26 inches.

Profiled Double Yellow Center Stripe
Two SOLID YELLOW lines, each 4 inches wide, separated by a 4-inch or 12-inch space. Double yellow center stripe is used as centerline delineation on multilane, two way highways and for channelization. Profiled double yellow center stripe has a profile or "bump" spaced every 26 inches.

Profiled Edge Stripe
A SOLID YELLOW line, 4 inches wide, used on the left edge of one-way roadways in the direction of travel. Profiled edge stripe has a profile or "bump" spaced every 26 inches.

Profiled Lane Stripe
A BROKEN WHITE line, 4 inches wide, used to delineate adjacent lanes traveling in the same direction. The broken or "skip" pattern shall be based on a 40-foot unit consisting of a 10-foot line and a 30-foot gap. Each profiled lane stripe has five profiles or "bumps".

Profiled Drop Lane Stripe

A BROKEN WHITE line 8-inches wide, used to delineate a lane that ends at an off ramp. The broken or "skip" pattern shall be based on a 15-foot unit consisting of a 3-foot line and a 12-foot gap. Each profiled drop lane stripe has two profiles or "bumps".

Profiled Gore Stripe
A SOLID WHITE line, 8 inches wide, used for delineation at ramp connections, to separate left and right turning movement from through movements, to separate high occupancy vehicle lanes from general purpose lanes, for islands, hash marks, and other applications. Profiled gore stripe has a profile or "bump" spaced every 26 inches.

Profiled No-Pass Stripe
A SOLID YELLOW line, 4 inches wide, separated from a skip center stripe by a 4-inch space where passing is prohibited from the lane bounded by the no-pass stripe. Profiled no-pass stripe has a profile or 'bump" spaced every 26 inches.

Materials.
Section 8-22.2 is replaced with the following:

Paint for pavement marking material shall be selected from the Qualified Products List. Paint shall be applied with a top dressing of glass beads.

Plastic pavement markings and profiled pavement markings, including ********** (*Fill in types of markings*) for this project shall consist of methylmethacrylate pavement marking material. The pavement marking material shall be a two-component system for application on asphalt or portland cement pavements.
Methylmethacrylate pavement marking material applications are as follows:

1. Type 1 Material. Type 1 material is formulated to be applied by hand operated extrusion device, pouring or hand trowel. This material is used for letters, transverse markings, long line flat markings, inset markings and symbols. The material contains intermixed glass beads and an abrasive material for skid resistance.
2. Type 2 Material. Type 2 material is formulated to be applied using the extrusion method with motor driven application equipment. This material can be extruded to form a raised pattern or "profile" on a base line. This material is used for profiled long line markings. The material contains intermixed glass beads and an abrasive material for skid resistance.
3. Type 3 Material. Type 3 material is formulated to be applied using the extrusion method with motor driven application equipment. This material is used for long line markings. The material contains intermixed glass beads and an abrasive material for skid resistance.
4. Type 4 Material. Type 4 material is formulated to be applied using the hand spray method. This material is used for letters, transverse markings and symbols. The material contains intermixed glass beads
5. Type 5 Material. Type 5 material if formulated to be applied using the spray method with motor driven application equipment. The material is used for long line markings. The material does not contain intermixed glass beads or abrasive material. Glass beads and abrasive material are injected into the spray stream at the point of application.

The equipment used for spray applications shall be designed for properly mixing the components at the point and time of application.

The material shall be composed of resins, reactive monomers and pigments. The material shall cure to 99% minimum weight and volume solids.

The material shall have the following performance characteristics:

1. Viscosity
   - Type 1 Material: 11,000-15,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 2 Material: 26,000-28,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 3 Material: 17,000-21,000 cps (ASTM 2196 Method B, LV Model, spindle #7 at 50 RPM).
   - Type 4 Material: 8,000-10,000 cps (ASTM 2196 Method B, LV Model, spindle #4 at 50 RPM).
   - Type 5 Material: White - 5,000-8,000 cps (ASTM 2196 Method B, LVModel, spindle #4 at 50 RPM).
   - Type 5 Material: Yellow - 7,000-11,000 cps (ASTM 2196 Method B, LVModel, spindle #4 at 50 RPM).
2. Component Mix
   - Type 1 Material: One gallon "A" (methymethacrylate) and 3 ounces "B" (benzoyl peroxide powder).
   - Type 2, 3, 4 and 5 Material: Four parts "A" (methymethacrylate) and one part "B" (liquid benzoyl peroxide).
3. No Track Time: 15 minutes after application at 40 mils (ASTM D711).
4. Hardness: Shore Durometer Type D, 55 minimum after 24 hours.
5. Tensile Strength: 125 psi min. at break (ASTM D638).
6. Elongation: 20% min. (ASTM D638).
7. Water Absorption: 0.5% max. (ASTM D570).
8. Chemical Resistance: The material shall show no effect after seven-day immersion in anti-freeze, motor oil, diesel fuel, gasoline, calcium chloride, sodium chloride or transmission fluid.
9. Ultra-violet Light: Ultra-violet light shall have no effect.
10. Adhesion: 200 psi on portland cement concrete, substrate failure on asphalt concrete cement.
11. Skid Resistance: 45 British Pendulum Units, minimum, (ASTM E303).

Type 1, 2, 3 and 4 pavement marking material shall be intermixed with a manufacturer approved abrasive material (2-4# per gallon) to achieve skid resistance requirements.

The Contractor shall provide to the Engineer a manufacturer's warranty for the methyl methacrylate pavement marking material. The warranty shall state that the manufacturer will repair or replace (at WSDOT's discretion) any material that fails within a period of 4 years. Failure is defined as any of the following:

1. The material fails to adhere to the substrate. Adherence failure is defined as a cumulative loss of line greater than 5% in any 300-foot length of pavement marking line.
2. The material reflectivity falls below 150 millicandellas per lux per meters squared for white material or 125 millicandelas per lux per meters squared for yellow material. Reflectivity failure is defined as a cumulative failure of reflectivity greater than 5% of any 300-foot length of pavement marking line.

3. The material discolors significantly.

The warranty period will start on the date the Engineer accepts the work. Reflectivity failure will be determined by using a Mirolux 12 or similar device. Cleaning of the markings is not allowed prior to reflectivity determination. If the material fails within the 4-year period, the manufacturer shall repair or replace the material within 6 months of the date of the request to repair or replace the material.

Construction Requirements

Preliminary Spotting

Section 8-22.3(1) is supplemented with the following:

The Contractor shall be responsible for providing a thin painted work line transferred from the control points provided by the Engineer. The control points will be provided at a spacing of 100-feet on tangents and 25-feet on curves on centerline only. The color of the work line shall match the color of the permanent lane or edge stripe. The painted work line shall be applied at a maximum of 4 mils thickness and shall have a maximum width of 2 inches.

Preparation of Roadway Surfaces

Section 8-22.3(2) is supplemented with the following:

New dense asphalt concrete pavement shall be allowed to cure a minimum of 14 days before the pavement marking material is applied. New open graded asphalt concrete pavement shall be allowed to cure a minimum of 28 days before the pavement marking material is applied. The methyl methacrylate pavement marking material shall be applied in accordance with the manufacturer's recommendations. Pavement surfaces shall be clean and dry for at least 24 hours, free from contaminants such as curing agents, surface oils or existing road marking materials prior to application of the pavement marking material. Contaminants shall be removed by approved mechanical means, such as shot blasting, turbo blasting or grinding. Installation on coal tar based asphalt is not allowed. The surface temperature shall be between 40° F and 105° F.

Paint Application

Section 8-22.3(3) is supplemented with the following:

Type 1 or Type 4 pavement marking material shall be applied at a thickness of 90 mils for crosswalk stripe, stop bar, traffic arrows, traffic letters, all symbols and drainage markings. (*Change thickness to 120 mils for open graded asphalt applications*)

Type 2 pavement marking material for profiled markings shall be applied a base line thickness of 90 mils *(Change thickness of base line to 120 mils for open graded asphalt applications)* and a profile thickness of 500 mils. All thickness measurements are from the pavement surface to the top of the marking. All profiles shall be the 2 to 3 inches long measured at the top of the profile and the same width at the base line. Each profiled lane stripe and each profiled skip center stripe shall have five profiles. Each profiled drop lane stripe shall have two profiles. The spacing on all profiles is 26 inches, plus or minus 1 inch. Profiled skip center stripe, profiled lane stripe and profiled drop lane

stripe shall have a lead-in length of base line material of 1 inch minimum before the first profile and a minimum of 1 inch of base line material after the last profile. The profiles shall be straight and square when viewed from the transverse direction. The profiles may be slightly rounded on the leading edge and the following edge; however, the thickness of the profile shall be a minimum of 500 mils.

Type 3 or Type 5 pavement marking material shall be applied to achieve a finished thickness of 90 mils for flat line longitudinal markings. If Type 5 pavement marking material is selected, two applications at 45 mils are required. (*Change thickness to 120 mils for extruded or two applications at a thickness of 60 mils sprayed for open graded asphalt applications*)

Maximum coverage per gallon of methyl methacrylate pavement marking material shall be as follows:

Thickness (mils)	Area (Sq Ft.)	4-inch wide line (Ft.)
45 mils Flat line	35.8	107.4
60 mils Flat line	26.8	80.5
90 mils Flat line	17.9	53.7
120 mils Flat line	13.4	40.3
90 mils with profiles	12.2	36.7
120 mils with profiles	10.1	30.4

Beading

Section 8-22.3(4) is supplemented with the following:

Glass beads for methyl methacrylate pavement marking material shall comply with AASHTO Standard Specification M247-81, Type 1, except the coating requirements are as follows:

Intermixed and drop-on beads for Type 1, 2, 3 and 4 material shall be treated with a saline coating to enhance adherence to the pavement marking material. The material shall contain 4 pounds per gallon of intermixed beads and the drop-on beads shall be applied at a rate of 6 pounds per 100 square feet.

Type 5 material requires two coats and a two-bead gun system for bead and anti-skid aggregate application. The lead bead gun shall apply the aggregate and beads on the first application. The bead application rate shall be 8 pounds per gallon and the aggregate shall be applied at a rate of 2 to 5 pounds per gallon. The first application beads (sinkers) shall be treated with a saline coating to enhance adherence with the pavement marking material. The second bead gun shall be turned off during the first coat application.

The first coat application shall be allowed to cure a minimum of 1 hour and a maximum of 4 hours. Loose beads, debris and dirt shall be swept off or blown off prior to the application of the second application.

For the second coat, the lead gun shall apply sinkers and aggregate at the same rate as the first application. The second gun shall apply drop-on beads with a coating to provide bisymmetrical positioning of the beads (floaters) on the surface of the material at a rate of 5 pounds per gallon.

Measurement
Section 8-22.4 is supplemented with the following:

The measurement for "Profiled Stripe" will be based on the total length of each 4-inch stripe installed. No deduction will be made for the unmarked area when the marking includes a skip line, such as skip center stripe, skip center stripe with no-pass stripe, lane stripe, reversible lane stripe, or two-way left-turn stripe.

The measurement for "Profiled Gore Stripe" and "Profiled drop Lane Stripe" will be measured by the completed linear foot of each marking type. No deduction will be made for the unmarked area when the marking includes a gap such as "Profiled Drop Lane Stripe"

Payment
Section 8-22,5 is supplemented with the following:

"Profiled Stripe", per foot.
"Profiled Drop Lane Stripe", per foot.
"Profiled Gore Stripe", per foot.

BB:vk RB_F_Mma993.doc

DRAFT

No Pass:
Policy Practice and Striping

Revised 4-15-2002

Forward:

The Headquarters Traffic Section and the NWR Traffic Section are considering significant changes to our current statewide and regional no pass striping guidelines. The information listed below is based upon the no pass striping revisions either under current consideration or implementation.

- The basic tool for determining no pass striping areas is via the range tracking method. The range tracking work is done by the Headquarters Data Section and is an on-demand process.

- The Headquarters Data Section issues a range tracking report for any highway corridor work it does. The report is issued to various staff members in the NWR Traffic Operations Group for their use.

  The last region wide range tracking work done by the Headquarters Data Section was in 1992. Several corridors have been redone since that time frame following major highway reconstruction projects. The checking, implementation and report data distribution of this updated information has been a somewhat haphazard process due to the lack of sufficient staffing and a good understanding of the amount of work necessary to implement the changes.

NWR – Traffic Operations Supplemental Guidelines:

- No-pass striping shall be based upon the range tracking information and may be modified by accident reduction and roadway geometric considerations.

  Informal studies have shown that the elimination of marginal (but reasonable) passing zones in a series of no-passing areas results in motorist frustration and subsequent abuse by passing in the no-pass areas.

  The construction of SMVTLs or shoulder driving lanes is strongly encouraged when there are no reasonable passing areas.

- The NWR Traffic Operations Group uses the "No-Pass Zone Guidelines" provided by the Headquarters Traffic Section for its site-specific reviews. These guidelines are part of the "No-Pass Striping Report".

- No-pass reviews should be based upon the 85th percentile speeds. However, most people use the posted speeds as a uniform review element. Using the posted speed the nominal passing areas between the no-pass zones should be:
  800 feet for posted speeds of 50 mph or less.
  1000 feet for 55 and 60 mph posted speeds.
  1200 for 65 and 70 mph posted speeds.

- Solid no-pass striping shall be used at the following locations:
  Channelizied intersections
  Railroad crossings
  Horizontal and vertical curves
  Bridge decks that have narrow traffic lanes
  Undivided multilane highways

- The current statewide policy for two-lane undivided highways is to **not** stripe no-pass zones at uncontrolled intersections, school crosswalks or school areas or where a series of driveways exist. However, no-pass striping may be considered in specific situations such as:

  A tangent area between two curves wherein an intersection lies in the tangent section and there is insufficient passing distance on either side of the intersection based upon the posted speed distances listed above.

  A tangent area between two curves wherein a major driveway having high vehicle and/or pedestrian activity lies in the tangent section and there is insufficient passing distance on either side of the driveway based upon the posted speed distances listed above.

  Two or more adjacent intersections having high vehicle usage and/or pedestrian activity and less than 800 feet spacing between the intersections.

  School crosswalks or school areas that have a passing incident when children are present.

  A series of closely spaced driveways having high vehicle usage and passing related accidents.

  The passing accident criteria used should be at least two or more passing related accidents within a 12-month period. One passing related accident in each of two successive 12 months may be considered as an alternate accident related criteria, if other criteria factors indicate a marginal reason to install no-pass striping.

- Incorporated cities or towns (under 22,500) -
  No-pass striping may be considered (if there are adequate passing areas on each side of the affected area):
  For a two lane undivided highway having a posted speed of 40 mph or less. This would be considered as a first step before considering a speed limit reduction.

  There are a number of intersections located less than 500 feet apart.

There are a number of closely spaced driveways having high vehicle usage and/or pedestrian activity.

- No-pass striping layouts -

  A double no-pass striping layout with a 12 inch spacing should always be used where the roadway lane widths are 10 ½ feet or greater.

  A double no-pass striping layout with a 4-inch spacing should be used where the roadway lane widths are less than 10 ½ feet.

  A double no–pass striping layout with a 4 inch spacing should be used at all channelized intersections.

  A single no-pass striping layout with a 4-inch spacing should always be used when the paint machines have a 3-gun setup for doing symmetrically single no-pass striping.

- Removal of centerline striping -

  If the centerline striping is done in paint, removal should be done using a shot-blasting machine wherein at least 75% of the existing striping is removed. The remainder can be painted over using blackout paint.

  If the centerline striping is done in a durable material, removal should be done using a grinding machine wherein 95%+ of the existing striping is removed. Repaint the grind area with blackout paint as an added measure to mask the grind line.

- Documentation -

  A no-pass revision form has been developed to document the no-pass zone changes. This form will be used for all future centerline revision work. Copies of the revision will be given to all personnel who are shown as having a copy of the Regional No-Pass Report.

VVK:vk RB_F_NoPass1.doc

DRAFT

Railroad Markings And Signing

Revised 4-15-2002

Background Information:

During the early 1990s time frame a series of meetings were held with the Washington Utilities Trade Commission (WUTC) Railroad Engineer, the Headquarters Traffic Section and the NWR Traffic Operations Group to discuss railroad striping, signing and to create a comprehensive NWR railroad inventory.

All the railroad crossings within the NWR were refurbished and a railroad inventory created during the 1994 to 1996 time frame. The striping was done using durable pavement marking materials with a projected service life of 5+ years.

NWR Traffic Operations Guidelines:

- Railroad refreshment striping will be considered when 50% or more of the striping has been worn off. Judgment call when 50 to 60% of the striping is still good. Do not replace if more than 60% of the striping is still good.

- Pavement marking installation -

  If a railroad crossing is on a side street adjacent to the state highway, do not place any pavement markings on the state highway. This includes any right or left turn lane pocket striping. Install only the advance side street railroad crossing warning sign (W10-2, -3 or -4) on the state highway.

  Do not install any railroad markings on the near side leg of a Tee or 4-way intersection, if there is insufficient room on the far side leg for any of the marking layouts listed below. Install only the advance W10-2 or W10-4 sign on the near side leg.

- Stop bar and pavement marking layouts -

  Because of tie down straps and other material that can come loose from the rail cars, always maintain a clear zone of 15 ft. parallel to the railroad tracks (as measured to the nearest rail).

  Placement of the first stop bar should be located no closer than 15 ft. to the nearest rail.

  If there is a drop gate, the first stop bar should be located 8 ft. in front of the gate.

If there is more than 75 ft between a crossroad and the railroad track, install the full railroad pavement marking layout pattern. The first stop bar will be located 15 ft. from the nearest rail. The remaining pattern will be laid out 10ft. (or more) in front of the first stop bar.

If there is only 50 to 75 ft. between a crossroad and the railroad track, install the first stop bar 15 ft. from the railroad track, delete the second and third stop bars and lay out the rest of the railroad pattern within the remaining space.

If there is only 40 to 50 ft. between a crossroad and the railroad track, install the first stop bar 15 ft. from the nearest rail, delete the second and third stop bars and lay out the rest of the railroad pattern within the remaining space (condensed layout). The "RR" markings can be placed at the mid-point of the "X" (one on either side) rather than at the leading edge of the "X".

If there is 40 ft or less between a crossroad and the railroad track, it is a judgment call if a stop bar should be installed. (NOTE: If there is less than 40 ft. clearance a vehicle may extend into the intersection (15 ft for stop bar + 25 ft for car length = 35 ft total length.

Do not stripe any stop bars or other railroad markings in the intersection radius return area when the railroad track is within 25 feet of the intersection extension line.

- Signs -
  Always install the W10-1 advance warning sign at the approaches to a railroad crossing, exclusive of the 40 foot or less distance criteria listed above. The location should be based upon the posted speed using the distance in Table II-1 (MUTCD). Use Condition B (stop condition) for the minimum sign placement distances.

  The W10-1 sign should be placed adjacent to "X" pavement-marking layout.

  On high speed roadways (50 + mph) where there may be a curve, etc. blocking visual sight between the railroad crossing and the signing and/or pavement markings, consider installing a supplemental sign at the beginning of the curve.

- Railroad Crossing Inspection Reports –
  The WUTC should send these railroad deficiency reports to the NWR Utilities Section for processing. The NWR Utilities Section will in turn submit a copy of the report to the NWR Traffic Operations Group. A striping work order will be sent to the Pavement Marking Group with a M-2 charge number.

  The completed work order will be returned to the Traffic Operations Group who will fill the corrective action part of the inspection report and return it to the Utilities for processing back to the WUTC

- Federal law states that all buses and trucks carrying hazardous materials must stop at each railroad crossing, unless the crossing has a plaque saying "EXEMPT".

VVK:vk RB_F_Railrd1.doc

DRAFT

Adopt-A-Highway (AAH) Signing

Revised 4-15-2002

The OSC and NWR Traffic Operations AAH guidelines are revised to reflect the following changes:

- The statewide AAH guidelines have been updated and the reader is referred to the revised AAH sign section in the January 2002 edition of the Traffic Manual.
- The statewide guidelines are further augmented with the

  AAH Guidelines -with logos for businesses

  Background Information:
  During the 1998 legislative session a billed was passed and signed into state law by Governor Locke that allows private businesses to adopt sections of state highways for litter control and/ or other roadside enhancement activities. The new law also allows these businesses to use their business logo, in *lieu* of the standard text group name, as is the case with volunteer groups. These businesses will be responsible for all costs involved with the fabrication and installation of the AAH signs for their adopted sections.

  Guidelines:
  The business is responsible for supplying the logo plaques to the department, by one of two alternatives. The first alternative: the business will supply a 0.050 *J* inch aluminum overlay plaque, with their logo mounted on the overlay, to the region prior to the installation of the AAH signs. In this case the region specialist will be responsible for fastening the business logo to the blank group name sign. The second alternative: the business will send their logo, on a pressure sensitive sign sheeting, to WSDOT's Central Sign Shop in Union Gap for application. For installations where the smaller group name sign (I6-902) is used, the logo shall be no larger than 27" X 15". For installations where the larger group name sign (16- 902A) is used, the logo shall be no larger than 45" X 15".

Additional NWR Traffic Operations Installation Guidelines:

- All AAH signs mounted on the same signpost must have the same width. Any sign width discrepancy should be brought to the attention of the work order originator and the issue resolved before proceeding with any further installation work.

- All AAH sign sizing and font sizes must conform to the Sign Fabrication Manual guidelines. If a sponsor's name will not fit the within the prescribed sign width, the sponsor's name letter height will

be downsized until the name can fit within the prescribed sign width. If a sponsor's name plaque is larger than the main AAH sign, it should be returned to work order originator for the proper downsizing.

- Logos that do not have any borders should not be installed. The plaques should be returned to the work order originator.

- AAH signs are to be placed 300 feet behind any major or other minor signs on high-speed highways. If this spacing cannot be met the sign should be located out of the mainstream line of signs and offset towards the right-of-way line. The signs shall be of such size and located in such a way as to not create undue visual clutter (per March 27, 1998 letter from Governor Locke).

- AAH signs are to be placed 300 feet behind any major sign; or, 300 feet either in front or behind any minor sign on low speed highways. If this spacing cannot be met the sign should be located out of the mainstream line of signs and offset towards the right-of-way line.

- Median and shoulder AAH signs can overlap one another. The median sign needs to state that it is for the median litter so the public is aware that the signs are for different litter work areas.

NWR Traffic Operations Work Order Guidelines:

- A sign inventory form is required for each work order in order to provide the proper tracking documentation.

- In the upper right hand corner of the work order form a notation should be made as to whether it is a volunteer or commercial AAH request. Volunteer request usually entails a sign fabrication order, whereas a commercial request does not.

- The Sign Order Number box must have a sign order number, if it is a volunteer request. If it is a commercial request, the box should say "N.A."

- Median signs must be clearly indicated as such in the work order so there is no confusion with a shoulder mount sign.

- The work order should state all the AAH sign widths to ensure that they are all the same width. This should help eliminate any mismatching of signs prior to going out into the field.

- AAH work orders are not given any priority over other signing work orders. Sign installation work can be accelerated if the work order originator approves weekend overtime work for the sign installation.

VVK:vk AAHSigns1.doc

DRAFT

Anti-Litter Campaign Signing

Revised 4-15-2002

Background Information:

The Department of Ecology (DOE) has been directed by the Legislature to develop a new anti-litter campaign throughout the state. The DOE will begin a marketing campaign in late April 2002.

The DOE has selected a number of highway locations through out the state for placement of the new signs. Locations were selected based upon: problem locations identified in the 1999 litter survey, ADT volumes; existing litter signs and scenic highways.

The DOE has selected 23 sites within the NWR of which three are existing sites. The DOE has requested that the signs for five of the sites be installed by no later than April 19, 2002 to correspond with the beginning of the marketing campaign. The remaining signs should be installed by no later than May 31, 2002.

Headquarters Traffic Guideline Information:

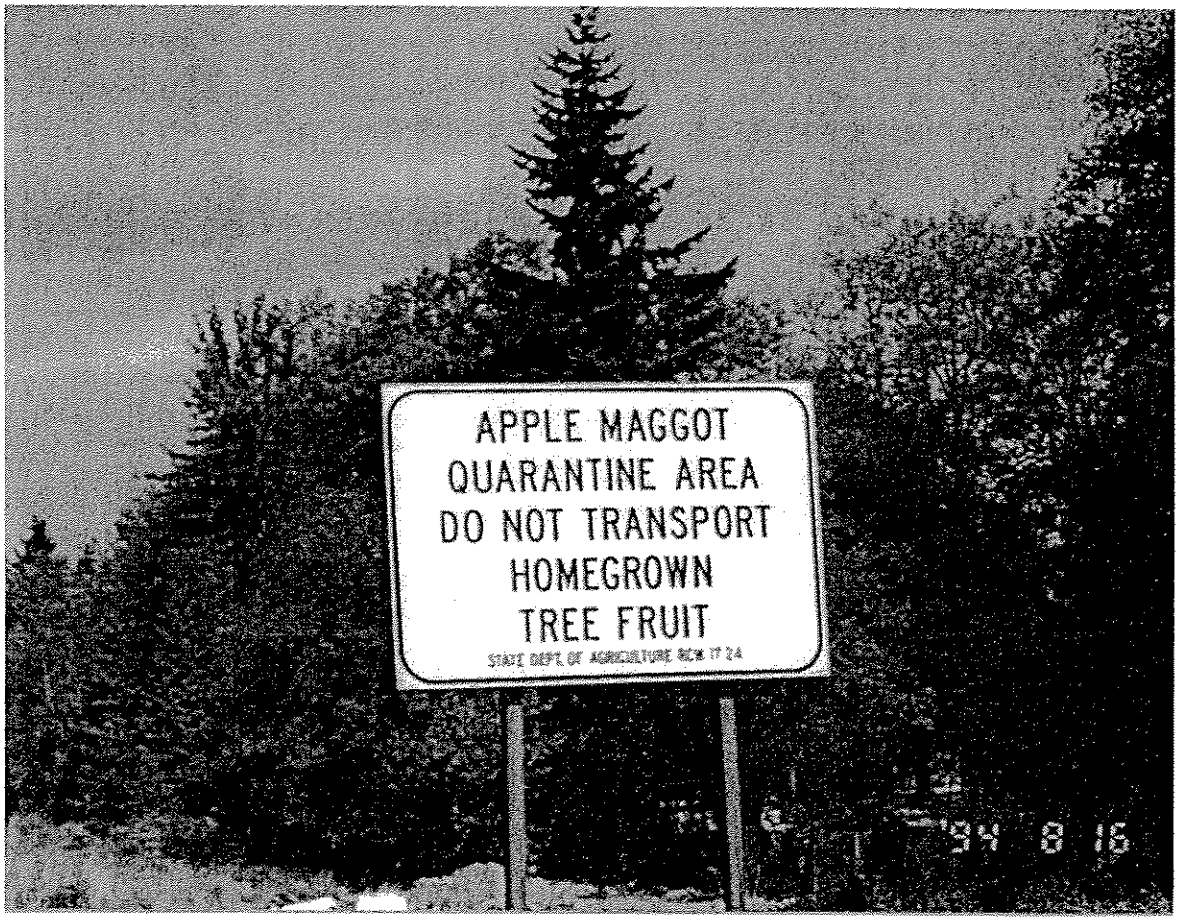
- The sign fabrication charge number is MS4390-02-1699, Org Code 343023.
- The NWR Traffic Operations Engineering costs will be absorbed in its QO budget.
- Sign installation costs will be absorbed as an M-2 charge by each Maintenance Area within the NWR per last year's Maintenance Superintendents' Meeting.
- The signs will remain in place for at least five years. The respective Maintenance Area at its cost will replace signs that are knocked down or vandalized within that time period.
- The signs are classified as incidental signs. The minimum sign spacing shall be 300 feet behind minor signs and 500 feet desirable behind major signs.

VVK:vk RB_F_AntiLitter1.doc

DRAFT

Apple Maggot Signing

Revised 4-15-2002



Background Information:

- This signing was installed at the request of the State Department of Agriculture (WSDA) in 1985. The Agriculture Department was and is trying to protect a $1,000,000,000 industry and 33,000+ jobs.

- Certain boundaries were established in an effort to stop harmful pests such as the maggot from increasing its range. Homegrown fruit is the biggest problem as many people carry this fruit throughout the state and do not realize that they are also transporting the maggot to new homes.

- Quarantine area boundaries were established for Spokane County, Klickitat County and all Western Washington counties, exclusive of Island, Skagit and Whatcom Counties.

- Type of signs -

Signing at state border areas	- Entering/leaving apple maggot quarantine area
Signing at borders to quarantine areas	- Entering/leaving apple maggot quarantine area
Signing within quarantine boundary areas	- Do not transport apples within this area

- If these signs are ignored and the problem becomes worse, the Agriculture Department may consider fruit inspection stations such as the ones that California has.

General Guidelines:

- WSDA is supposed to pay for the sign fabrication, the initial installation costs and any sign maintenance costs via a JA Account.

- Entering / leaving boundary sign locations–
  SR 2 (east of Gold Bar)
  SR 5 (north of the Whatcom County line)
  SR 20 (east of the SR 530 junction)
  SR 90 (east of North Bend)
  SR 410 (east of Greenwater)

  Please note WSDA has rescinded the SR 5 Canadian border crossing area location in favor of the SR 5 Whatcom County line area location via a January 20, 1999 e-mail.

- Reminder signs within the quarantine areas -
  Reminder signs are in place at various locations on SR 5, SR 18, SR 20, SR 90, SR 405 and SR 522. Over the past several years the condition of these signs have deteriorated to such a point that they need replacement. To date, the WSDA has not indicated to us that they want these signs replaced.

  After discussions with OSC Traffic a decision has been made not to replace any of these reminder signs:
  if the space is needed for other signing purposes;
  if a location is within a contract area the sign will be removed and not replaced; and,
  if a sign is knocked down or vandalized, it will not be replaced.

- An 800-foot sign spacing distance should be used for the sign placement, based upon the amount of information on the sign.

VVK:vk RB_F_AppleMaggot1.doc

DRAFT

Banners

Revised 4-15-2002

Forward:

The assembly of these guidelines was done in order to provide a guideline summary to those NWR staff personnel who may be involved with the design, fabrication or installation of banners. This summary may also provide useful information for those staff members who handle banner inquiries from the general public.

Please note that the OSC and NWR Traffic Operations Supplemental Guideline sections are dynamic. Additions and deletions to these sections can and should be expected to occur. If you have any comments about these guidelines, please contact the NWR Traffic Regional Operations Group or the NWR Traffic CTCO Group.

NWR- Traffic Operations Supplemental Guidelines:

- Any banner installed on a state owned signal pole or luminaire pole would normally require a wind loading review.

- Banner installation approvals are required from WSDOT, if:
  The banners are mounted to state structures within limited access areas
  The banners are mounted to state structures within non-limited access in unincorporated areas
  The banners are mounted to state owned structures (e.g. signal poles) within non- limited access in incorporated areas
  The banners are overhead banners that span the state highway

- Banners are classified into three groups based upon time.

Special event banners	-	30 days or less
Semi-permanent banners	-	31 days to 1 year
Permanent banners	-	1 year or longer

- Special event banners -
  A private group or a local agency may sponsor banners.
  This type of banner request should be submitted to the NWR Traffic CTCO Group.
  The NWR CTCO Group will issue a "Special Event" approval letter that will include the banner approval.

(No "General Permit" is required for a special event banner.)
Subject to the banner size, the banner request may be forwarded to the NWR Traffic Operations Group for a wind loading review.

- Semi-permanent and permanent banners -
  A local agency rather than a private group should sponsor these banners.
  Local agency semi-permanent and permanent banner requests should be processed through the NWR TransAid Section.
  The NWR TransAid Section will forward the requests to the NWR Traffic Operations Group for wind loading reviews.
  A General Permit is required for this type of banner. A general permit application would be issued by the NWR Utilities Group.

- Luminaire mounted banners -
  Banners 30 SF or under will not require any wind loading reviews, unless a sign is also attached
  A review will be required, if the combined area of both the sign and the banner is more than 20 SF.
  When banners have a total area in excess of 20 SF, the banners need to have wind slits. (Check with the sign fabricator for usual practice on the number and placement of wind slits.)
  Banner mounting (bracket attachment) should be in accordance with the manufacturer's recommendation.

- Signal pole mounted banners -
  Banner criteria are the same as that listed for luminaire-mounted banners. However, a more in-depth review is required for signal pole mounted banners to make sure that the overall wind loading safety factor is not exceeded. Other items that must be considered in the signal pole reviews are the signal mast arm location and length, the signal head locations, the location of any mast arm signing, etc.

- Shoulder mounted banners –
  The bottom of the banners should be mounted 10 feet above the roadway.

- Overhead banners –
  The bottom of the banners should not be less than 20 feet above the roadway.

- Wind loading reviews -
  The NWR Traffic Operations Group does not do the actual wind loading calculations. Staff personnel gather any necessary data and submit the data to the OSC Bridge and Structures Division.

- The OSC Bridge and structures Division reviews -
  Review time may vary depending upon the banner locations, signal mast arm and other pole mounted sign locations. At present, the review turnaround time is approximately one week for luminaire pole reviews, but may exceed 60 days for signal pole reviews depending upon the amount of hardware attached to the signal pole.

- Information normally needed for the wind calculation reviews -

Banner size (with or without slits)
Banner/pole attachment drawing (manufacture's catalog cut)
WSDOT pre-approved or approved signal/luminaries pole specification data -name of the pole manufacturer, the pole height, pole size, signal/luminarie arm (length and number, indicate if a single or double arm), pole material (aluminum or steel).

VVK:vk RB_F_Banners.doc

DRAFT

Bicycle Signing

Revised 4-15-2002

W11-1 Bike Symbol Sign

Mileage distance plaque

Forward:

The bicycle striping and signing guidelines have changed considerably over the past several years, especially in regards to the striping layouts. The reader is referred to the 2000 edition of the MUTCD and January 2002 edition of the OSC Traffic Manual for the general bicycle guidelines.

NWR – Traffic Operations Supplemental Guidelines:

Striping for designated bike lanes -

- The use of the bike lane diamond symbol has been discontinued. The diamond pavement marking should be removed from all bike lanes as time permits.
- The preferred pavement marking is the bike symbol depicting a rider (with helmet) facing the centerline of the highway (not the curb line or shoulder line).

- At least two pavement-marking symbols will be used per block section. The 1st symbol should be placed approximately 10 feet beyond the crosswalk or radius return point. For blocks under 500 feet in length, the 2nd symbol should by placed 10 feet prior to the next intersection crosswalk or radius return point. If the block is 501 to 1,300 feet in length place a mid-block (3rd symbol) at the mid-point between the 1st and 2nd symbols. Place additional bike symbols on a 500 ft spacing, if the block section exceeds 1,300 plus feet in length.

- A directional arrow (six foot long) may also be used. If used, the arrow should be placed 6 to 10 feet beyond the bike symbol.

- All bike pavement markings shall be done in MMA material.

- The bike symbol dimension can be 4 x 2 foot or 4 x 3.25 feet in order to fit within the nominal 4-foot bike lane width and appear proportionally correct.

- The use of the word legend "Bike Lane" is acceptable, but is not encouraged.

Signing for designated bike lanes -

- The use of the bike lane diamond symbol on the bike signs has been discontinued. The diamond marking shall be covered over on all existing signs as time permits.

  You may continue to use the R3-17 bike sign as long as the diamond symbol is masked out.

- A bike sign should be placed adjacent to each pavement marking bike symbol, if possible.

Signing guidelines for bikes on roadway –

- The reader is referred to the OSC Traffic Manual Page 2-13 for general signing information.

- The principal criteria for determining if a W11-1 (or W11-101) sign is warranted is whether the shoulder width is less than four feet or not.

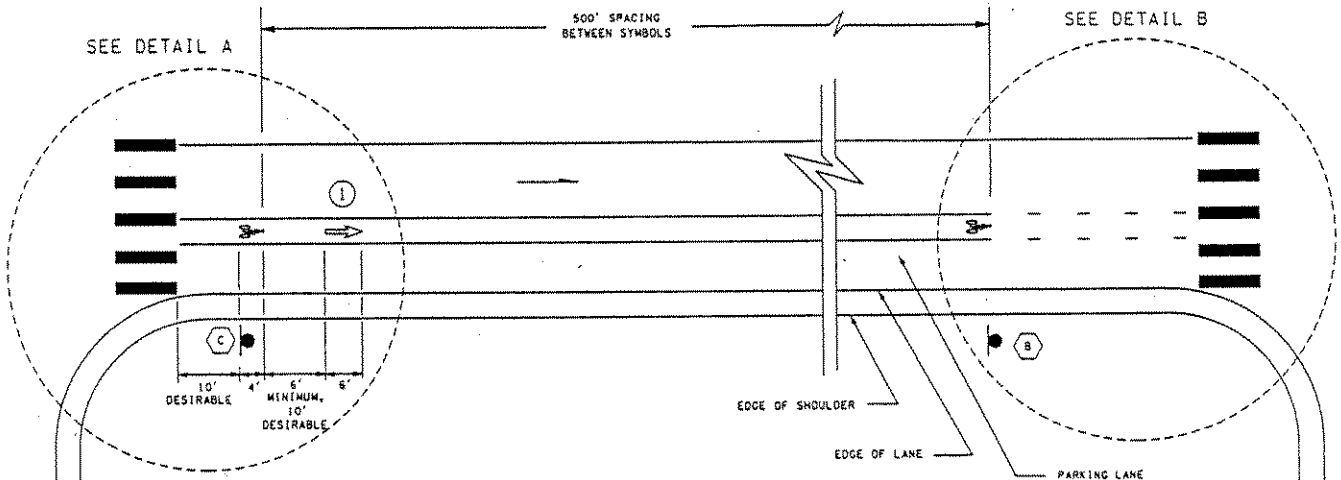
- A mileage plaque should be used to inform motorists of the distance that they could expect to encounter bicyclists riding in the traveled lane.

- The bike sign should be placed within the first 300 feet of the beginning point where the narrow shoulder width begins. If the mileage distance is three to eight miles, a reminder sign should be placed at mid-point. If the mileage distance exceeds eight miles, place reminder signs on a five-mile spacing.

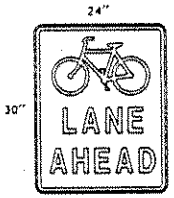
VVK:vk RB_F_Bicycle1.doc

NOTES:

(1) DIRECTIONAL ARROW IS AN OPTIONAL ITEM.

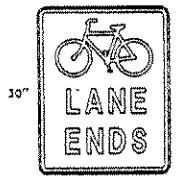


SIGNS:



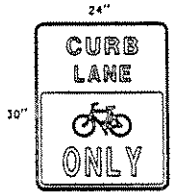
R3-16

A



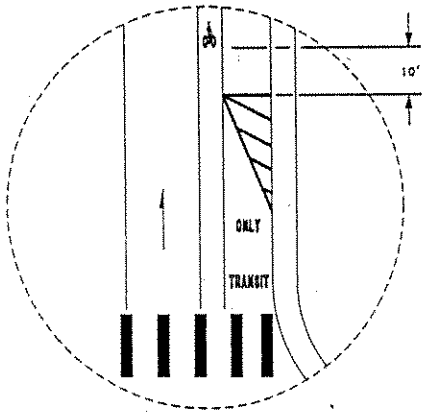
R3-16a

B

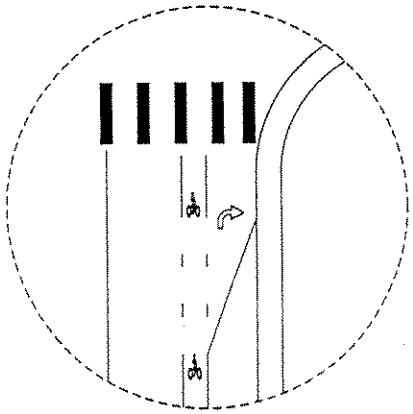


R3-17

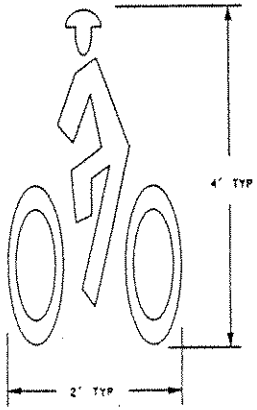
C



DETAIL A



DETAIL B



BIKE LANE
PAVEMENT SYMBOL

WSDOT-NORTHWEST REGION

Approved _____ Date _____
Dave McCormick
Region Traffic Engineer

NOT TO PS&E QUALITY
NOT TO SCALE

FILE NAME	s:\4141ZT\Region Ops\RED BOOK - CURRENT\STRIPEDetails\F - ADI - AID CONNwy\DemoDrawings.dgn		
TIME	12:24:46 PM		
DATE	05/04/2002		
DESIGNED BY			
ENTERED BY			
CHECKED BY			
PROJ. ENGR.			
REGIONAL ADM.	REVISION	DATE	BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

Washington State Department of Transportation

BICYCLE SIGNING - PAVEMENT MARKINGS AND SIGN LAYOUTS

REV. 5-4-02 JBR

NW REGION TRAFFIC OPERATIONS

PLOT12

F-B6

SHEET 3 OF 3 SHEETS

DRAFT

College And University Signing

Revised 4-15-2002

Forward:

The college and university signing guidelines have changed considerably over the past several years. The reader is referred to the January 2002 edition of the OSC Traffic Manual (page 2-20) for general guidelines.

- A school must be accredited in order to qualify for signing. Verification is through the NW Association of Schools and Colleges. Its web site is www.cocnasc.org. The agency's telephone number is (425)-827-2005.

NWR – Traffic Operations Supplemental Guidelines:

- In the past we have allowed signing on multiple highways when a college or university meet the mileage criteria. Due to the increasing demand for sign space we cannot continue to allow this type of multiple highway signing. Signing will now be limited to the nearest and most direct interchange or intersection.

- Metropolitan and urban area boundaries can be determined from using the state urban boundary map.

- In metropolitan and urban areas where two or more colleges or universities share a common campus, enrollments may be combined. However, the enrollment for the minor school should be at least 600 FTEs or 1,000 students (full or part time).

- Two schools may not share the same sign, if they do not share a common campus. The common campus criteria would be met if both schools are located within one block of each other. The common criteria is not met if the two schools are located "say" ¼ mile apart from each other.

- If two schools are located in the same general area, but do not share a common campus, the school name would be based upon the following priority (in descending order):
  State university
  State college
  Private university or college
  Technical college or school

- All sign spacing should meet our 800 ft. spacing requirement. If we reduce the spacing requirement to say 600 or 700 ft we should document the reasons why and be able to justify the reasons if contested in the future. If we reduce the sign spacing, we may reduce the sign size by reducing the letters "one size" downward. The rationale for this is to reduce the conflict with other nearby guide signs, etc. i.e. reduce the size of university signs so motorists will have no difficulty in reading and reacting to the nearby guide signs.

- The enrollment criteria can be based on the attendance figures for any semester or quarter within the last school year. If a school enrollment falls below the minimum number for one year, the school will be given written notice that the highway signing will be removed if the following fall semester or quarter enrollment doesn't reach the minimum number. Usually the fall semester or quarter is the highest enrollment period of the year.

- If the requested signing is in a city exceeding the 22,500 limit and on a non-limited access facility, we can turn the signing request over to the city for its review (and installation). If the city approves the sign request, the sign would have to be placed "back of sidewalk" or out of the clear zone area, if possible. The sign size should meet the city-signing standard, but cannot exceed state standards (in size).

VVK:vk RB_F_College1.doc

DRAFT

Compression Brake and Unmuffled Compression Brake Signing

Revised 4-15-2002

Background Information:

During the mid-1990's and late 1990's a number of compression brake discussions were held with the Headquarters Traffic Section and other Regional Traffic Sections. By and large the general viewpoint, based upon observations and comments received from local traffic agencies, local police agencies and the WSP, were that these signs had no impact value and were essentially unenforceable.

To try and meet the signing demand that local area residents were and are asking for would become an impossible task to meet. For the most part the local agencies were asking for the installation of these signs to help placate the local area residents.

The Headquarters Traffic section has assembled a comprehensive set of guidelines for both compression brake and unmuffled compression brake signing. These guidelines can be found in the January 2002 edition of the Traffic Manual, Chapter 2.2, Subsections L and M.

All previous NWR Traffic Operations Draft Compression Brake guidelines are now null and void and should be discarded.

NWR Traffic Operations Supplemental Guidelines:

Compression Brake Signing –

- Compression brake signing will not be installed along any state highway unless requested by the local agency.
  The local agency must enact a compression brake ordinance. The ordinance must be a noise ordinance, not a traffic ordinance. The ordinance must meet the Department of Ecology regulations and meet the RCW 70.107.060(3) "*special conditions*" criteria.

- Sign locations on access controlled facilities -
  If a request meets the above conditions, sign installations may be considered as follows:
  The traffic noise ordinance number must be included as part of the sign message (Sign Fabrication Number R4-604);

Only two such signs should be installed per state highway. One sign would be placed on each approach to a local entity. The signs may be added to the city entrance marker or be a stand-alone sign located inside the jurisdictional boundary, if there is sign space;

If there are major interchanges or intersections along the state highway and the connecting streets are not state highways, a departure sign maybe considered at these locations, if space permits. The number of these signs should not exceed two (one each direction) within a five-mile distance. If there are multiple interchanges or intersections within a five-mile distance, the reminder signs should be placed at the distance mid-point.

Reminder signs will not be allowed at each interchange or intersection;

Reminder signs will not be allowed at each interchange ramp or cross-street area. The local agency may place reminders signs on the cross-streets at the right-of-way boundary line on its side of the boundary line, but not on the state side;

Reminder signs will not be placed on highway downgrades or multiple times on the same downgrades.

- Sign locations on non-access controlled facilities within incorporated areas –
  The Department will not install any signs on non-accessed controlled highways within incorporated areas. The local agency may install and maintain such signing as long as such signing does not become a distraction or create a sign spacing problem with other signs that the Department is responsible for.

- Sign spacing -
  This type of sign is viewed as a minor sign:
  For freeway installations a nominal spacing of 500 feet between signs should be used;

  For conventional 2-lane, high-speed roadways a nominal spacing of 300 feet should be used;

  For multilane and 2-lane, low speed facilities within incorporated areas a nominal spacing of 150 feet should be used.

  This sign must be placed behind any major signs that may be within the same area.

Unmuffled Compression Brake Signing –

- This sign should be reserved for usage only at border crossing areas and departure ramps from weigh stations.

  This sign can also be considered for use at departure ramps from rest areas, if space permits.

- This sign may also be installed along state highways, but only under special situations and if the Regional Traffic Engineer approves such action.

- Sign spacing -
  Signs at border crossing areas will be incorporated into the border crossing sign layout. This sign would be the last sign within the layout and match the sign spacing used for the other border crossing signs for that specific highway.

  The nominal sign spacing for on-ramps will be 150 feet between signs.

VVK:vk RB_F_CompBrake1.doc

DRAFT

Deer (Animal) Warning Signs

Revised 4-15-2002

OVERVIEW

A number of studies have been conducted throughout the United States on the effectiveness of deer signs and other devices in reducing the number of deer related accidents. Almost all the studies have shown that deer signs are usually the least effective method in reducing deer related accidents. The same holds true for other types of animal signs.

The NWR Traffic Operations Group presented a position paper (dated May 15, 1998), which discussed the deer signs and other devices used to discourage deer from entering the roadway areas. The information listed below was extracted from that position paper.

Deer sign background information –

- Deer signs are passive devices and their use has not resulted in a decrease of deer related accidents.

- Deer signs have very limited value from the standpoint of alerting drivers to the presence of deer. Any positive value obtained from the signs would depend upon:

  The type of deer in the area. The signs have more value where there are migrating deer such as white tail deer versus resident deer such as black tail deer.

  The signs being used on a limited time basis such as when the deer are migrating during the spring and fall seasons. During the summer and winter seasons the signs should be removed. Motorists tend to ignore deer signs left in place on a year round basis, but notice the signs more when they are used on a rotating basis.

  The signs are placed at known migration routes rather than in areas where resident deer live. Migration routes have limited exposure along a highway, whereas resident deer may have a broad exposure along a highway. Motorists tend to forget a sign message within 10 to 20 seconds after passing a sign. If mileage plaques are used, the distance listed should not exceed 1 or 2 miles. Repeated usage of deer signs along a highway segment has not proven to be any more effective than just one sign.

- Deer signs have some limited value from the standpoint of public relations and tort liability.

- Wildlife reflectors such as the Strieter Warning Reflector have had some limited success depending upon the type of deer involved. The Strieter reflector has helped in reducing deer related accidents in areas where whitetail deer live, but not where black tail deer live. Use of the reflectors will only address night time related accidents and not daytime accidents. To be effective the reflectors require a significant amount of maintenance, which may negate the benefits derived from their use.

- Deer fences in conjunction with specialized highway deer crossings have proven to be effective, especially in areas where deer migrate. Such fences have limited value where resident deer live. Deer fences are more suited to rural areas where the crossings can take advantage of the terrain.

- Reducing vegetation along the roadside will aid motorists in seeing deer. However, it won't reduce or prevent deer from crossing or wandering along a highway.

- Highway lighting installed at deer crossing areas has not proven to be effective from both an accident reduction standpoint and from a maintenance standpoint.

- Wildlife warning whistles have not proven to be effective at all, although the whistles seem to have some effect on white tail more so than black tail deer.

NWR Traffic Operations Guidelines:

The NWR Traffic Operations Group receives over six deer sign requests a year from the general public and local agencies. This does not count miscellaneous other types of animal signing. The deer requests have centered on the installation of deer signs rather than in some type of positive action that would restrict deer access to a highway.

Based upon the results of the various deer studies that have been done to date, the NWR Traffic Operations Group recommends that no deer signs be installed within the NWR, as they don't have any value in reducing the number of deer-vehicle accidents.

From a public relations standpoint and taking into account that the deer in our region are resident deer, it may be acceptable to install deer signs as 'occasional' reminder signs. The criteria for such reminder signs should be based on a more definitive approach, which takes into account deer concentration areas, yearly deer population fluctuations and yearly deer kills.

Proposal criteria for installing deer signs:

a.) A minimum of five WSP reported deer-vehicle accidents per mile per year for at least 2 years in the latest 10 year time period.

Or

b.) A minimum of 10 carcass counts per mile per year for at least 3 years in the latest 10 year time period.

And

c.) Deer sign mileage plaques would be limited to a maximum of 2 miles.

d.) Existing deer signs should be removed, if the reported deer kills or carcass counts fall below a 50% support level of the numbers shown in either Items a or b.

We should continue to explore any proposal that could reduce the potential deer-vehicle conflict. Our goal should be to focus on proposals that would deter deer from crossing the highway or at least provide safe crossing points such as 'deer over crossing or under crossing' points.

VVK:vk RB_F_Deer1.doc

DRAFT

DUI Victim Memorial Signing

(formerly known as the DWI Program)

Revised 4-15-2002

Forward:

The DWI Program is a pilot program that began in 1994 and is still an on-going pilot program. Several years ago the program's name was changed from DWI to DUI. The pilot program is a team effort of the Transportation Commission, Washington State Department of Transportation (WSDOT), Washington Traffic Safety Commission and the Walla Walla DUI Task Force.

The Headquarters Traffic Section is in charge of the program and approves any memorial signing request. The current person in charge of the program is Mike Dornsfeld (360) 705-7288.

General signing information:

- The sign features the words "'Please Don't Drink and Drive", below which is a plaque displaying the message "In Memory Of" together with the victim's name. They are placed near the scene of the accident. All state highways, except the interstate system are eligible for signing under this program. The Department of Transportation has no jurisdiction on county roads or city streets, and thus, cannot provide signs along those roadway systems.

- Signs can be installed if the driver causing the accident was convicted of vehicular homicide under the purview of RCW 46.61.520, or was fatally injured and shown to be DWI based on blood toxicology reports.

- The sponsors pay for the signs. The sign fabrication and installation costs are around $400 for non-multilane installation and around $500 for multilane installation. The signs will be manufactured at the WSDOT Sign Shop in Yakima. Two signs are installed at each site, one in each direction. Signs on four-lane (multilane) highways are larger.

- Sponsors must be members of the immediate family. A sponsor can also be a non-family member acting in behalf of the family. In this case the sponsor would have to present a letter from the family showing that the family has given its permission for the sponsor to act in their behalf.

NWR – Traffic Operations Supplemental Guidelines:

- The NWR Traffic Operations Group will review all proposed sign location sites to see if signs can be placed at the requested locations. Sponsors usually request the signs to be installed at the accident sites. It may not be possible to locate the signs at the accident sites. Signs may be placed as much as ½ mile away from the accident sites.

- Sign placement guidelines –

  On multilane, high speed highways use the 800-foot spacing criteria
  On 2-lane, high speed highways use the 800-foot spacing criteria if the sign is placed in front of a principal guide directional, supplemental guide directional or MIS sign. Use the 500-foot spacing criteria, if the sign is placed behind the aforementioned signs.
  On low speed highways in incorporated areas, use the 300-foot spacing criteria whenever possible.

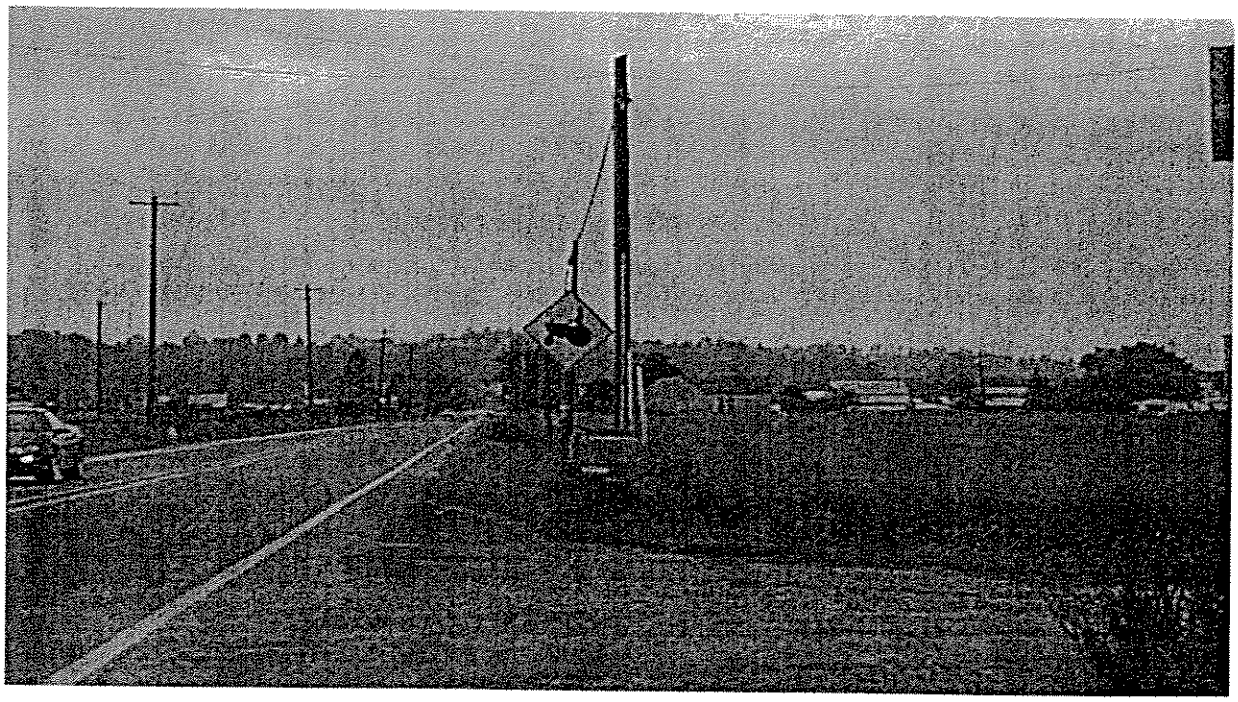
  Another factor to consider on high-speed facilities is the problem of site visits. The signs should be located at widened shoulder areas, which would permit off-roadway parking. While site visits are discouraged, they are not forbidden. There have been several near-accidents caused by site visits wherein visitors' parked their vehicles partly or wholly on the roadway. Site visitors should remember to exercise caution when visiting these sites so they are not involved in an accident.

VVK:vk RB_F_DUII.doc

DRAFT

Farm Machinery Signing

Revised 4-15-2002



Background Information:

The use of different farm equipment signs, cattle crossing signs and farm logo backboards has been discussed at length with the Headquarters Traffic Section and other Regional Traffic Sections. All agree that that there has been an overuse of these types of signs.

- The use of the Farm Machinery sign W11-5 and the Cattle Crossing sign W11-4 should be limited to areas having a sight distance problem and/or a demonstrated accident problem.

- The use of the W11-5 with a mileage plaque (W13-401) may be warranted, if farm equipment travels a section of roadway for some distance and there is limited sign distance. Before any signs would be considered the farm equipment must be equipped with the reflective hazard triangle sign and have a flashing beacon to alert motorists to the presence of the farm equipment. If the farm machinery is equipped with these items and there still are documented problems supported by an accident history, WSP complaints, farmer complaints, etc., the warning signs may be installed.

- The use of "Watch for Farm Equipment" type signs is discouraged. Sign usage should be based on a documented problem supported by an accident history, WSP complaints, farmer complaints, etc.

- The use of the farm logo boards should be discontinued. The NWR has been using logo boards with a green background. Both the FHWA and Headquarters Traffic Section have stated that these backboard signs are not in compliance with the MUTCD. The FHWA has also stated that switching to a yellow or black background is also unacceptable. They both have recommended the use of individual signs rather than a logo backboard. Generally, you will not encounter a location that requires multiple signing.

- The AgFARMation type sign may be permitted as an off-premise Type 1 sign. The sign size is limited to 150 SF.

NWR – Traffic Operations Supplemental Guidelines:

- The use of logo backboards will be discontinued and individual signs will be considered as requested by the Headquarters Traffic section.

- The farm machinery sign (W11-5; size 30" x 30") may be used as an advance crossing sign. Refer to Section 2C-31 of the MUTCD.

- The W11-5 sign may also be warranted when you wouldn't expect to see such rural type farm machinery on the highway due to urban development along the highway. For example - an agriculture farm still being operated in an area that has or is being developed for housing, commercial or industrial use, etc.

- Need to consider exposure factor i.e. a sign may be warranted when you have as little as four crossings per day on a high volume roadway vs. 20 crossings a day on a low volume roadway. (Note: The crossing numbers are arbitrary figures used to establish a reference point.)

- You should not install such signing for farm machinery traveling along a roadway until you have tried other alternatives, which include but are not limited to the following:
    1. Check the accident records to see if a safety problem really exists.
    2. Confirm that the equipment has the triangle hazard symbol mounted on the back of the machinery.
    3. Require that a yellow flashing beacon be mounted on the machinery's roof. Motorists may not even notice the farm machinery sign or not believe it (if they have been driving the road before and never seen any farm machinery on it). A flashing beacon will be more of an aid, as it will attract the motorist's eye to the beacon and then the equipment.
    4. Check to see if alternate routes are available.
    5. If the machinery must be on the highway, it should be driven on the shoulder if possible. The farmer should be asked to restrict highway driving to daylight hours and non-peak periods, if there are any significant rush hour periods.
    6. If a sign is warranted and the farm machinery will be driving for "say" more than 1/4 mile on the highway, you should consider adding the supplemental (W13-401) distance plaque noting the mileage.

- The cattle crossing sign should only be used when there are frequent cattle crossings at a specific site. Crossings used once a day would warrant a sign, whereas a crossing used once a month would not.

- Cattle signs used for the movement of cattle along a highway are strongly discouraged. By and large there are no open rangelands or cattle movement areas along state highways in the Northwest Region. Cattle movements along NWR highways would be considered very infrequent, wherein farm equipment with flashing beacons could act as 'shadow' vehicles for the protection of the cattle movement and to make approaching motorists aware of the cattle movement.

VVK:vk RB_F_FarmMachine1.doc

DRAFT

Fatality Markers

Revised 4-15-2002

General Fatality Marker Information:

It is the policy of the Washington State Department of Transportation (WSDOT) to facilitate the grieving process for those family members who, after the loss of a loved one in an automobile related accident on a state highway, contact WSDOT expressing a desire to place a memorial within WSDOT right of way.

The type of memorial, location, and duration of the memorial shall be mutually agreed upon between the family and the NWR Traffic Section, within the guidelines listed below.

- To help the family through its mourning period WSDOT is willing to install a memorial for the person who died. Requests must be in writing and received from or approved by the deceased's family.

- The memorial may be a planting, wooden marker or small monument. The planting, wooden marker or monument should be located near the right of way line, well removed from the traveled way and areas having frequent maintenance activities. A memorial should be located where it poses the least distraction, safety and liability risk to the traveling public. A planting or small monument may be considered as being permanent memorials. A wooden marker should be considered as being a temporary memorial.

- An option to fatality markers is a donation to support driver education. An example may be a donation to the Washington Transportation Safety Commission to promote seat belt safety, motorcycle helmet safety, bicycle helmet safety, DUI announcements, safe speed awareness, etc.

- Fatality marker signs will not be allowed. If the accident was alcohol-related, it may be possible to qualify for a "In Memory of _____" sign under WSDOT's DUI Victim Memorial signing program.

Fatality Marker Location -

a. The Department strongly encourages a memorial sponsor to consider placing a living memorial at the closest Rest Area to the accident site than having anything placed at the accident site. A Rest Area site would offer more choices on the type of living memorial and would also allow for a memorial plaque sign. In addition, a Rest Area site offers a safer environment to visit.

b. Fatality markers cannot be placed on interstate highways or ramps, because of Federal Highway Administration regulations. However, under certain conditions, a permanent planting may be allowed in interstate rest areas, subject to the approval of the Region Traffic Engineer.

c. Fatality markers may be placed on any non-interstate highway subject to the approval of the Region Traffic Engineer.

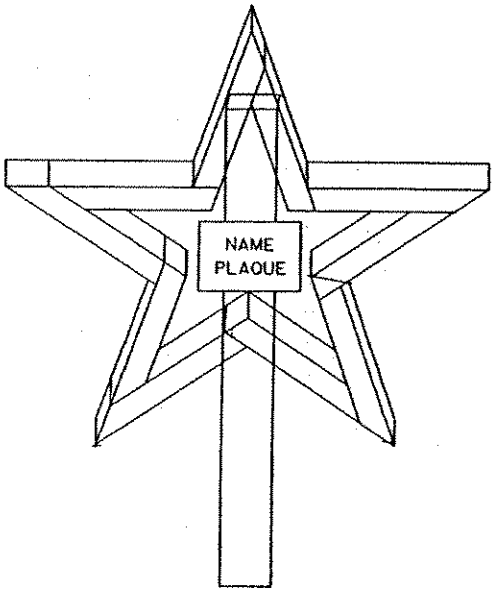
Type of Fatality Markers -

a. In areas where conditions permit, live plantings are encouraged as the preferred type of fatality marker. The plantings may be wildflowers, shrubs or trees.

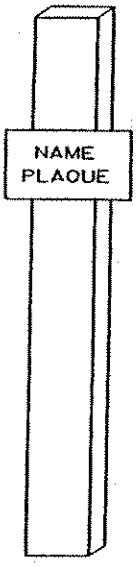
b. A wooden marker can be an alternative fatality marker. The wooden marker may be installed on a state highway for a memorial period of six months. The memorial period should not extend one month beyond the first anniversary date of the person's death.

If the deceased's family wishes to have a wooden marker, the marker can be either a plain vertical marker or a 5-point star marker. No religious symbols of any type, including crosses, can be allowed.

5 POINT STAR MARKER



VERTICAL MARKER



c. In areas where conditions permit, a small monument may be installed as an alternative fatality marker. The monument should be located adjacent to the R/W line so it will not interfere with any maintenance activities.

- The monument should be made of stone or concrete and limited in size to one foot in any direction. The monument must be mounted flush to the ground.

- The monument may have an inscription placed on it as long as the inscription is considered reasonable and approved by WSDOT.

Site Visitation -

The deceased's family may be asked for its cooperation in limiting the number of people wishing to visit the site at any one time. The restriction is necessary from a safety standpoint, as WSDOT does not want to see someone injured while visiting the site.

Fatality Marker Cost and Maintenance -

The fatality marker's sponsor will be responsible for the planting, wooden marker or monument material, along with the fabrication and installation cost. The state will furnish a cost estimate for any fatality marker request that it approves for installation.

VVK:vk RB_F_FatalityMarker1.doc

DRAFT

Fire District Boundary And Fire Danger Signing

Revised 4-15-2002

Fire district name is acceptable

Sign type is acceptable

Added supplemental sign is not acceptable

Forward:

The reader is referred to the January 2002 edition of the Traffic Manual's DNR Fire District Boundary and Fire Danger Sign sections for general information.

NWR – Traffic Operations Supplemental Guidelines:

- The fire district boundary sign shall only be installed at the fire district's boundary. The sign should be installed within 1,000 feet of the district boundary. The sign should conform to the WSDOT Sign Fabrication Manual sign number I8-804. The sign color should be white letters on a blue background.

- The fire danger sign (with arrow) is allowed, if placed under the fire district sign. Stand along fire danger signs are not encouraged as there is no supporting information on whom to call, if a motorist sees a fire.

- A fire district should submit its signing request in writing to either the NWR Traffic Operations Section or the local Maintenance Area. The request must be signed by the appropriate person with authority to make such requests, such as the District Fire Marshall. The fire district must agree to properly maintain the fire danger sign e.g. to cover the sign during the winter when there is no fire danger or replace it when the sign message or colors begin to fade or fail.

- The fire district boundary and fire danger signs must be installed outside the normal sign layout line e.g. near or at the right-of-way line. If the sign is installed within the clear zone it must meet clear zone breakaway requirements. The mounting posts shall be no larger than 4x4 inches and the fire district sign mounted at a height of seven feet.

- Sign installation and maintenance costs –
  The fire district will be responsible for all costs associated with the sign fabrication, initial installation and maintenance.

  WSDOT can fabricate and/or install a sign for the fire district via a JA Account
  Or
  The fire district can fabricate and install a sign, if the local Maintenance Area approves such action.

RB_F_FireDanger1.doc

DRAFT

Fire Hydrant Signing

Revised 4-15-2002

Background Information:

During the early and mid-1990's a number of meetings were held with various fire departments in the greater Seattle area and NWR Design and Traffic staff to discuss the usage and placement of fire hydrant signs on state highways. The fire departments were mainly concerned about the placement of noise walls along the interstate highways and how they may mask or impede access to fire hydrants.

Several memorandums and a position paper were issued concerning fire hydrant access considerations with design highway noise walls. The Headquarters Traffic Section revised its Traffic Manual guidelines to reflect some of the criteria discussed in the memorandums and position paper. The reader is referred to January 2002 edition of the Traffic Manual, Chapter 2 Section 2.5 Miscellaneous Signing Subsection K – Fire Hydrant Marker Signs.

Fire hydrant signs are an aid to the fire departments in locating fire hydrants. These signs have no priority over other highway signs and shall not interfere with the placement of other signing. No advance fire hydrant signing will be allowed.

NWR – Traffic Operations Supplemental Guidelines:

- Fire hydrant marker/symbol (I7-401) is viewed as an incidental sign. No sign spacing criteria has been set for this sign as its location is dictated in part by the location of the fire hydrant. The sign should be positioned out of the normal signing line.

- Sign location:
  These signs should be placed no further than 1,000 feet from a fire hydrant.

  Parallel signing –
  The signs should normally be placed parallel to the roadway. They should be visible from the shoulder, near or at the right of way line mounted on a face post or individual signpost. The sign can also be mounted on a noise wall.

  Perpendicular signing –
  Perpendicular signing may be allowed for easier sighting, if requested by the fire department and approved by the NWR Traffic Operations Group.

- Sign size and supplemental line messages –
  The nominal size is 24 x 24 inches. A line message can be inserted on a plaque beneath the sign stating the distance from the sign to the fire hydrant and/or cross street name if a noise wall blocks the view of the cross street. This supplemental information should only be placed on parallel signs not on perpendicular signs.

  It may be permissible that both a parallel sign and a perpendicular sign reside on the same post in order to provide easy sign recognition while traveling at high speed and then to provide additional information when the fire trucks have stopped and are preparing to find the nearby fire hydrant.

- Reflective lane markers –
  The Department will not install or maintain the "blue" Type 2 reflectorized RPMs. The local fire station or district may install and maintain these RPMs at its own costs.

- Noise wall design consideration -
  During the design of a noise wall the designers should take into account fire hydrant locations, wherein it may be possible to install an access door at or near a fire hydrant so fire department personal can have a more direct access to the fire hydrant.

  An access door may also aid in laying out the fire hose lines wherein a hose line does not have to be thrown over the wall but can be handed through the access door. The access grade around the door area should be such that it is easily traversable in a fire emergency situation. Access doors should be at least 4 feet wide to allow for emergency fire personnel to maneuver through the doorway with their gear.

VVK:vk RB_F_Fire Hydrant1.doc

DRAFT

Highway Advisory Radio (HAR) and Tourist Information Station (TIS) Signing

Revised 4-15-2002

Background Information:

Since the 1994/95 time frame, both the Headquarters Traffic Section and the NWR Traffic Section have been involved in the development and implementation of Highway Advisory Radio (HAR) and Traveler Information Station (TIS) sites.

The Headquarters Traffic Section has issued an extensive amount of information with its January 2002 edition of the Traffic Manual. This information can be found in Chapter 2 Section N – Signing for Highway Advisory Radio and Traveler Information Station. This information is different from the previous NWR Traffic Operations' HAR/TIS supplemental guidelines.

The development and implementation of any HAR sites within the NWR is done by the NWR Traffic TSMC-ITS Group. Site layouts will still be coordinated with the NWR Traffic Operations Group to ensure that there are no conflicts with other highway signing.

The review of any TIS sites within the NWR is done by the NWR Traffic Operations Group.

NWR – Traffic Operations Supplemental Guidelines:

HAR Sites -

- HAR sites will be processed through the TSMC-ITS Group. The ITS Group shall coordinate proposed site locations with the Traffic Operations Group.

- HAR sign type -

  a. If the HAR sign is a static sign, it should meet the minimum sign spacing requirements listed below.

  b. If the HAR sign includes a VMS display, it should meet the desirable sign spacing requirements listed below.

- HAR sign spacing -

  Sign message visibility and readability time should be based upon the length of the message divided by the reading time of 3 words per second times the posted speed of the highway.

  And

  A minimum sign spacing of 800 feet with a desirable sign spacing of 1,500 feet for interstate and multilane, high speed facilities,
  Or
  A minimum sign spacing of 500 feet with a desirable sign spacing of 1,000 feet for conventional 2-lane, high-speed roadways,
  Or
  A minimum sign spacing of 300 feet with a desirable sign spacing of 500 for multilane and 2-lane, low speed roadways in incorporated areas.

TIS Sites -

For tourist information and recreational purposes, Travelers Information Station (TIS) signing may be installed on highway right of way under the following criteria:

- The broadcast messages for a TIS sign shall be noncommercial in nature and consistent with FCC Regulation, CFR 47, and Section 90.242(a) (7) which specifies the content of HAR messages per the following paragraph. The FCC recognizes HARs as "Travelers Information Stations".

  "Travelers Information Stations shall transmit only noncommercial voice information pertaining to traffic and road conditions, traffic hazards and travel advisories, directions, availability of lodging, rest stops and service stations, descriptions of local points of interest. It is not permissible to identify the commercial name of any business establishment whose service may be available within or outside the coverage area of a Travelers Information Station. However to facilitate announcements concerning departures/arrivals and parking areas at air, train, and bus terminals, the trade name identification of carriers is permitted."

  There can be no radio signal overlap between adjacent radio stations.

- The requesting agency must submit a written TIS signing request to the NWR Traffic Operations Group for review. The request should include the broadcast signal boundaries along the highway(s) to help determine viable sign locations.

- The NWR Traffic Engineer must approve the request before any sign fabrication and installation work can commence. Permits will be issued on a "first come -first served" basis.

- The requesting agency is responsible for all costs associated with the TIS sign fabrication, installation, and maintenance.

  WSDOT can fabricate and/or install the signs via a JA Account.

  Signs will be fabricated per WSDOT's sign fabrication standards.

  The TIS signs shall be white reflective legend on blue reflective background. TIS signs for recreational purposes (National Parks, National Forests, and National Historic Reserves **ONLY)** may be white reflective legend on brown reflective background. These federal agencies may also incorporate their official agency logo on the TIS sign.

- Sign spacing –
  800 feet for interstate and multilane, high speed roadways.
  500 feet for conventional 2-lane, high-speed roadways.
  300 feet for multilane and 2-lane, low speed roadways in incorporated areas.

- A TIS sign has no priority status and most compete for sign space with other supplemental guide directional, MIS and TOD signs.

  Neither a HAR nor a TIS sign is considered to be a supplemental guide directional sign and does not have to compete with the guide directional signing criteria as such.

- General radio information needed for processing of request -

Radio station frequency -	530 AM
Broadcast range -	2 ½ miles
Hours of operation -	24 hours/day, 7 days/week
Antenna height -	50 feet
Radio information -	message length should allow the message to be repeated twice while in the broadcast range.

- Sign layout –
  Sign should be limited to three message lines and can also include a logo.
  Logos should be nationally recognized logos.
  The nominal size sign should be 32 SF ("say" 4 ft height x 8 foot width)
  Signs should not exceed 100 SF in size.
  Only one sign will be allowed in each direction of travel for the broadcast range.

- Examples of existing TIS sites:

I-5	Southcenter I/C area	SeaTac Airport
SR 20	MP 17 & 28	Ebey's Landing National Historical Reserve
SR 16, 169 & 410	Enumclaw area	Information related to Mt Rainer, USFS, and county fairgrounds

Please note that the USFS will again assume control of the Enumclaw signs in 2002 from the Enumclaw Chamber of Commerce. WSDOT has agreed to fund the new signs. USFS will be responsible for any subsequent sign changes and maintenance costs.

VVK:vk RB_F_Radio1.doc

DRAFT

Indian Reservation Signing

Revised 4-15-2002

Background Information:

Since the 1994 time frame, both the Headquarters Traffic Section and the NWR Traffic Operations Group have been involved in formulating Indian Reservation signing guidelines. These guidelines are still going through a dynamic state of change as the various Indian Reservations make additional requests for different types of signing.

The NWR Traffic Operations Group had installed signing for several Indian Reservations prior to the creation of the guidelines. Under the guidelines these particular reservations would not qualify for the signing that they were given. After several discussions between the Headquarters Traffic Section and the NWR Traffic Section an understanding was reached that the signing could remain in place until the signs reached the end of their service life or if there was a sign spacing problem and a higher priority sign was needed at that location. When any of these conditions occur the Indian reservation sign could be removed and not replaced.

The Indian reservation signs covered by this understanding are:

I-5	SR 20 I/C vicinity	Swinohmish Indian Reservation
I-5	SR 542 I/C vicinity	Nooksack Indian Reservation

The January 2002 edition of the Headquarters Traffic Manual lists the current general guidelines for Indian reservation signing.

NWR – Traffic Operations Supplemental Guidelines:

- Treat the reservations as "entities" since they are considered as Indian nations. Under this scenario we would sign for them the same as we would for any city or town requesting destination signing. The signing request should be in writing and be signed by appropriate tribal council or person in authority. The request must state what type of destination signing they want.

- Destination signing will be allowed on a state highway, if the reservation is within five miles of that highway. Entering/Leaving Indian reservation signs will also be allowed on a state highway, if the highway passes through an Indian reservation. The boundary limits shall be the original treaty boundary limits. Both types of signs will be "white on green" signs.

_____Indian Reservation Next Right or "X" Miles
Ramp follow-through signing would give mileage if more than 1 mile away.
Entering/Leaving _____ Indian Reservation

If a reservation qualifies for both types of signs and there is a sign spacing and/or sign clutter problem, only one of the two types of signs should be installed.

Mileage destination signing will be restricted to the highway nearest the reservation. Interstate signing would only be considered, if the reservation is within the five-mile criteria and there was room for such signing with no other supplemental guide directional signs already in use at that interchange location.

If a state highway passes through an Indian reservation that has a 'patch work' boundary layout, consider placing the one set of boundary signs that bridges the entire patch work layout rather than installing individual sets of signs for each boundary location.

Any wording in the destination signing that refers or implies gaming or casino will not be allowed

- Additional signing for the Tribal Center or Community Center may be allowed at the nearest and most direct interchange or intersection, if the center meets the current heritage, cultural, historic or museum criteria and the five met criteria is also met. Signing under the TOD program may also be acceptable, if the TOD criteria is met. These signs will be "white on brown" signs.

  At present, we do not allow the word "tribal" to be used in lieu of "Indian" except for the tribal center sign.

  _____Tribal Center Next Right or "X" Miles

- The various Indian Nations are becoming more active in requesting various types of signing in part to gain more advertisement recognition for/to their gambling casinos. The Department will not install signing that promotes the gambling aspect, but can install qualifying MIS signs that may include the gambling aspect within the specific MIS logo.

  Any gaming or casino references in the MIS and TOD signs should be eliminated or reduced in size per our current guidelines. (Reduction guidelines - 50% letter size of the qualifying business letter size and/or 1/3rd or less of the overall logo layout). The MIS and TOD signs are intended to assist the general public, including minors, when they are looking for gas, food, lodging, etc. Casino type wording is intended for a select portion of the public and may be considered offensive, inappropriate and politically incorrect to the majority of the public.

VVK:vk RB_F_IndianRes1.doc

DRAFT

Landscape and Vegetation Signing

Revised 4-15-2002

General Guidelines

It is the policy of the Northwest Region to allow landscape/vegetation acknowledgement signing within landscape/vegetation areas, when requested by citizen groups or clubs, businesses or local jurisdictions, according to the following sign criteria:

- One landscape/vegetation acknowledgement sign may be allowed, as specified within a General Permit, along the backside of a ditch or bottom of fill area, near or at the R/W line (similar to Adopt-A-Highway sign placements), for the landscape/vegetation area described within the General Permit.

- The signing must be placed outside the normal signing line layout (sign spacing will not apply) and must be placed in a position parallel to the highway or ramp.

- For limited access facilities the sign will only be allowed between the ramp and the R/W line and must not be visible to mainline traffic.

- It is recommended the sign size be limited to 3 ft x 3 ft and the letter size be limited to 2" to limit distraction to motorists. This is not considered a highway sign and there should be no attempt to size the sign for motorist readability.

- When the sign wears out, as determined by WSDOT (typically within 7 years), the sign sponsor shall be notified to replace the sign or the sign shall be removed.

- When the General Permit expires or the landscaping/vegetation is no longer maintained, the sign shall be removed.

- The sign shall not contain any advertising or service club information, or resemble a city/community entrance sign.

- The sign design including size, message layout, color, and sign fabrication material must be submitted to Traffic Ops for review and approval.

VVK:vk RB_F_Landscape1.doc

DRAFT

Left Lane Truck Restriction Signing And Keep Right Except When Passing

Revised 4-15-2002

Overview:

RCW 46.61.100 requires all vehicles to keep right except when passing other vehicles on multilane highways. The RCW was amended in 1986 to denote that the left-hand lane of any state highway with two or more lanes in the same direction be used primarily as a passing lane. The RCW was further amended in 1997 to prohibit trucks or combinations over 10,000 lbs from using the left lane of limited access highways having 3 or more lanes in one direction.

Pertinent Laws and Regulations

RCW 46.61.100 - Keep Right except when passing, etc.
Section 2. - Upon all roadways having two or more lanes for traffic moving in the same direction, all vehicles shall be driven in the right hand lane .....
Section 3. - No vehicle towing a trailer or no vehicle or combination over 10,000 lbs. may be driven in the left lane of a limited access highway having three or more lanes in one direction .....
Section 4. - It is a traffic infraction to drive continuously in the left lane of a multilane roadway when it impedes the flow of other traffic.

RCW 47.36.260 - Signs indicating proper lane usage.
The department shall erect "*Keep right except when passing*" signs on multilane highways indicating proper lane usage.

WAC 468-XX-XXX - Left Lane Restrictions
Section 1. - Restricts trucks or combinations over 10,000 lbs. from the left lane where there are 3 or more lanes in one direction. A left hand HOV lane is not considered the left lane of a roadway.
Section 2. - Lists the vehicle exceptions to Section 1. Several of Section 2's subsections are listed below:

Subsection a (i) - At all times, motorcycles towing trailers
Subsection a (ii) - At all times, Class B motor homes without a motor vehicle or trailer in tow.
Subsection a (iii, iv) - Roadside emergency requiring a tow truck over 10,000 lbs. Emergency vehicles such as fire trucks or emergency care vehicles over 10,000 lbs.

Subsection a (vii) - When conducting official business within the left lane, any department vehicle towing a trailer or weighing over 10,000 lbs.

Subsection b lists the exclusion areas to Section 1.

WAC 468-XX-XXX - High Occupancy Vehicles (HOV's)
Section d restricts trucks in excess of 10,000 lbs. GVW from using HOV lanes regardless of the number of occupants.

NWR – Traffic Operations Guidelines:

Restricted truck lane areas –

- Left lane truck restriction areas on multilane highways –
  Restriction areas will be signed using the following types of signs:
  Vehicle With Trailers or Over 10,000 Lbs./Prohibited in Left Lane R4-302
  Slower Traffic Keep Right R4-3
  The "Slower Traffic" will be used as a general reminder sign for all traffic to keep right.

- Multilane highways where the truck lane restriction does not apply -
  Open areas will be signed using the following types of signs:
  Keep Right Except to Pass R4-301
  State Law/Vehicles Must Keep to Right Except to Pass I8-901
  (The state law sign is for use only at a border or regional boundary location)

- The above signs should be installed using a minimum sign spacing of 5 miles and a maximum sign spacing of 10 miles between signs.

  The signs should not be placed within 1/2 mile of an interchange or intersection to preclude any conflicts with other required signing at the interchange or intersections areas

- The truck lane restriction is only applicable to limited access highways having 3 or more general-purpose lanes in one direction, unless the area has been designated as an exclusion (or open) area.

  If the length of a 3 lane section exceeds 5 miles, both the "Vehicle with trailer...." sign and the "Slower traffic keep right" sign should be used on an alternating sign cycle to inform motorists that trucks are restricted from the left lane and that general traffic should not use the left lane unless passing slower traffic. The sign spacing between the alternating signs should be a 5-mile minimum between signs.

- Trucks in excess of 10,000 GVW are also prohibited from using the HOV lanes.
  At the present time, no HOV lane truck restriction signing has been enacted. However, if a HOV lane and a GP truck lane restriction are adjacent to one another an R4-302B sign will be installed to inform truckers to use the "x" right lanes.

- Sign locations and spacing –

A truck lane sign shall be placed on the right side of the highway at the beginning of a truck lane restriction zone. If median space permits, a truck lane restriction sign should also be placed on the left side of the highway.

A truck lane sign should be placed every 5 miles thereafter to remind truckers of the lane restriction. However, a "Slower Traffic ...." sign may be placed in lieu of the truck lane restriction sign, if the region is receiving complaints about vehicles staying in the left lane (Keep Right signs cannot be used in these areas). Please be aware that a "Slower Traffic ...." sign has a low impact value and it may be better to retain the truck lane restriction sign.

The truck lane restriction sign should have a high impact value and as such would be considered a major sign with a nominal sign spacing of 800 feet.

The slower traffic sign has a low impact value and as such would be considered a minor sign with a nominal sign spacing of 500 feet.

Non-restricted (open) and exclusion truck lane areas -

- Areas having no truck lane restrictions are denoted by the "Keep Right Except To Pass" signs.

  The beginning of the non-restricted truck lane areas will have a Keep Right sign placed on the right side shoulder. No left side is required. Reminder signs will be placed on a 5 to 10 mile spacing.

  The nominal sign spacing between signs should be 500 feet.

- Exclusion area boundary sign locations are referenced by interchange names to allow more flexibility in the placement of the signs. By using the general interchange name as a reference point; no changes in the traffic regulations would be necessary, if a sign is relocated to a different location within that interchange area.

- Exclusion (exception) Areas at 3+ lane locations:

  a.) SR 5 - Northbound from the SR 405/Southcenter Interchange (Exit 154A) to the SR 529 Interchange in Everett (Exit 194)

  b.) SR 5 - Southbound from the SR 405/Southcenter Interchange (Exit 154A) to the SR 526 Interchange (Exit 189 to Paine Field/Mukilteo)

  c.) SR 90 - East and west bound between the SR 5 Interchange in Seattle (Exit 2A) and the SR 405 Interchange at Factoria (Exit 10A)

  d.) SR 5 - Southbound from the 200th St. Interchange (Exit 151) to the SR 405/Southcenter Interchange (Exit 154A). Please note that this exclusion area is only for vehicles with trailers and Class B recreational vehicles. Truck and truck combinations over 10,000 lbs are prohibited from using the left lane in this exclusion area.

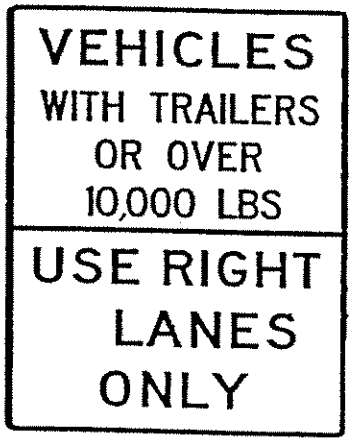
  By agreement with the Washington State Trucking Association "Keep right except to pass" signs denote exception areas where truckers can use the left lane. In order to be in compliance with

the left lane restriction for all vehicles on multilane roads "Slower traffic keep right" signs will be used in conjunction with the "Vehicle with trailer..."where the truck lane restriction is in effect.

R4-302 Sign

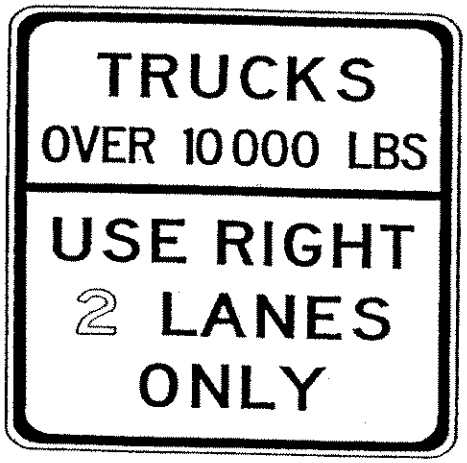
This is the general truck lane restriction sign that we are to use on interstate highways that have 3 or more lanes in each direction and no inside (left) HOV lane. Nominal sign spacing is 5 miles between signs.

The "Keep Right Except To Pass" sign denotes the end of a truck lane restriction section or where there is no truck lane restriction.



R4-302B Sign

This sign is suppose to be used on interstate highways that have 3 or more GP lanes and an inside (left) HOV lane.
NOTE: 500 ft. pass the end of an inside HOV lane, install an R4-302 sign to continue the general truck lane restriction. Do not install a "Left Lane Open To All Traffic" sign.



R4-302A Sign

This sign is to be used only for the SR 5 southbound lanes at the South Center hill vicinity.
NOTE: 500 ft. pass the end of an inside HOV lane, install an R4-302 sign to continue the general truck lane restriction. Do not install a "Left Lane Open To All Traffic" sign.

VVK:vk RB_F_TruckRestriction1.doc

DRAFT

Logo Signing
(usage with legends/symbols)

Revised 4-15-2002

Background Information:

With the increasing demand for logos and logos with legends or other symbols, the NWR -Traffic Operations Group is establishing additional guidelines for the sizing and use of logos in order to fit within available sign space. If logos are used in conjunction with legends and symbols, the logo sizing will be in proportion to these items in order to create a reasonable overall sign size.

Logo sizing must be contained within the general parameters listed below:

MUTCD Logo and Symbol Sizing Guidelines -

Park & Ride Lot Signs (Section 2D-41: Sign D4-2)-

- Typical sign size is 30 x 36 inches.
- Color is reflective white on green.
- The sign may contain both the carpool symbol and local transit logo (or symbol).
- These logos may not exceed 18 inches in height.
- The logos are to be placed at the top part of the sign.
- The local transit color, if used, shall be the standard color of the transit agency.
- If a specific transit logo is used it may be necessary to include the logo within a white border or use a white background in order to retain its distinctive shape and color.

General Service Signs (Section 2D-45; Signs D9-1 to 14) -

- Typical generic symbol plaque is 24 x 24 inches.
- Color is reflective white on blue.
- Intermixing symbols and word messages on one sign shall not be permitted.

General Information Signs (Section 2D-48; I series signs) -

- Typical generic symbol plaque is 24 x 24 inches.
- Color is reflective white on green.
- Airport, busses and train symbols normally fall within this category.

Other Supplemental Signs (Section 2E-28) -

- Main line park & ride lot signs are considered as supplemental signs.

- Color is reflective white on green.

Size of Logos and Signs (Section 2G-5.3) -

- Motorists Information Signs (MIS) are shoulder mount signs.
- Max of six logos for gas and four logos for the other remaining services.
- For logo sizes see Table II-4.

General Information Recreational and Cultural Interest Symbol Signs (Section 2H-10; RG-010 to RG-200) -

- Color is reflective white on brown.
- Typical generic symbol plaque is 24 x 24 inches.

WSDOT Traffic Manual -

Section 10 (page 2-17) -

- Do not combine MIS and general service signing on the same sign installation. Services should be signed under the logo program rather than the general services program, if possible.
- Service signs include the police and hospital signs.
- Color is reflective white on blue.

NWR -Traffic Operations Group Guidelines:

The following guidelines were developed in cooperation with the Headquarters Traffic Section. The guidelines listed below do not include the MIS logo guidelines. The reader is referred to the MUTCD and the Traffic Manual for the MIS logo guidelines.

General Logo Information -

- All logos must have a border around the logo in order to define the logo area.

- A legend may be allowed within the logo area, if the legend is considered to be a unique part of the logo. The legend may be all upper case letters or a combination of upper and lower case letters with the first letter of each word being an upper case letter. The legend size must be in proportion with the overall logo size, but should not exceed 1/3rd the logo area.

- All of the logo colors must be reflective except for the color "black". The logo colors cannot give the appearance of being any regulatory or warning type color layout.

Overhead Signs -

- The nominal size for 'grouped' overhead logos (or symbol combinations) should be 24 x 24 inches. These dimensions can be increased to 30 x 30 inches, if the sign contains only a group of two logos. These dimensions can be increased to 36 x 36 inches, if there is only one logo. The increased logo sizing will also be subject to the sizing of any line messages on the sign; and, any dead load and/or wind loading considerations.

- The maximum number of 'grouped' logos allowed on an overhead sign will be restricted to four

logos or symbol combinations.

- Overhead guide directional signs may mix different types of logos, if there is insufficient sign space for separate signs.

Shoulder Mount Signs -

- The nominal size for 'grouped' shoulder mounted logos should be 24 x 24 inches in size. These dimensions can be increased to 30 x 30 inches, if the sign contains only a group of two logos. These dimensions can be increased to 36 x 36 inches, if there is only one logo. The increased logo sizing will also be subject to the sizing of any line messages on the sign; and, any dead load and/or wind loading considerations.

- Maximum number of logos permitted on a sign structure is four logos or symbol combinations. Shoulder mounted logos should be grouped by type rather than mixed, as may be the case with overhead signs. A typical classification type backboard would be a "transportation" backboard, such as the Bellingham and Mt. Vernon transportation backboards.

Transit Logos -

- Effective with the implementation of these guidelines, specific local transit logos will not be permitted on any highway mainline or highway ramp signs. The only exception to this guideline will be the signs located at park and ride lots, which can list/show the specific transit agencies serving that facility.

  All mainline and ramp signs that have specific transit logos will have the specific logo replaced with a generic bus logo as time permits.

- An exception to the above guideline will be made for Sound Transit. Sound Transit is considered a multi-regional agency. As such the use of a Sound Transit logo may be more viable to the public in alerting them to the Sound Transit multi-use facilities. The Sound Transit logo may be used by itself or with other related logos and symbols.

- A Sound Transit multi-use facility sign can include the Sound Transit logo, the facility name and a maximum of four symbols. The symbols must be related transportation symbols defined in the MUTCD. Non-MUTCD symbols will not be acceptable.

  At this writing, the Headquarters Traffic Section is still considering the status of the Amtrak logo as an additional logo or to be considered as part of the four-symbol total.

- The nominal letter size for the Sound Transit line message should be 10"D. This size can be reduced to 10" C, if necessary to fit within the available sign space.

VVK:vk RB-F_Logo1.doc

DRAFT

Median Crossover Signing

Revised 4-15-2002

Forward:

All median crossovers must be approved by the Headquarters Geometric Design through the PS&E approval process. An inventory of approved median crossovers should be maintained by the NWR for reference.

Background Information:

During the late 1990 time frame the NWR Traffic Operations Group began receiving numerous requests for median crossovers. Most of the requests were from the WSP. During the review process, it was discovered that the majority of existing median crossovers had never been approved or documented. In addition, there was no standardization of the crossovers in terms of type, placement, frequency and signing. The NWR Traffic Operations Group made an inventory of all the existing crossovers.

The Headquarters Geometric Design Section reviewed the crossover locations with the FHWA and stated that the majority of crossovers were not in compliance with FHWA guidelines and could not be approved. A series of meetings were held with the FHWA, the WSP, the Headquarters Geometric Design Section and the NWR Traffic and Design Sections to evaluate, which crossovers were needed and could be approved after meeting FHWA guidelines.

Design Considerations:

- All permanent median crossovers must be designed and approved per the guidelines noted in Section 960 of the WSDOT Design Manual.
- All temporary median crossovers installed for construction projects must be removed at the end of the respective contracts. Temporary crossovers cannot remain in-place unless a Headquarters Geometric Design Section approval has been obtained. This includes any WSP request for the retention of a site-specific temporary median crossover.
- WSP median crossover requests must go through the same Headquarters review process as any other median crossover request.

VVK:vk RB_F_MedianCrossover1.doc

DRAFT

Refuse Station Signing

Revised 4-15-2002

Background Statement:

Transfer and recycling center signs are considered as unwarranted (or non-conforming) signs. Neither the MUTCD nor the WSDOT Traffic Manual recognizes these types of signs. The signs provide guidance only to a limited group of motorists and not to the traveling public at-large.

The Headquarters Traffic Section does not support the installation of these signs because of the statewide ramifications that this type of sign installation would cause. After further consultation with the Headquarters Traffic Section, an informal agreement was reached to allow these signs in certain situations.

NWR – Traffic Operations Guidelines:

A city or county is strongly encouraged to sign for its transfer station off of a state highway. A city or county may install a stand alone "transfer or refuse station" sign on its side of an intersection right-of-way line. The sign would be considered as a Type 1 sign. If a city or county wants a highway sign, it must meet the following conditions:

- The word "Transfer" will not be allowed due to potential misunderstandings by the public as to what the word means such as possible confusing with transportation hub centers that may also be called or referred to as transfer stations. The word "Garbage" will not be used as some people consider it to be an inappropriate word to use on a sign.

- The word "Refuse" must be used in lieu of the word "Transfer".

- Refuse station signing cannot be installed on any interstate facility, as it is not a qualifying sign per federal guidelines.

- Signing to a refuse station site will only be allowed on a non-interstate highway, if a specific site is hard to find because of the surrounding roadway system layout. The site must also be located directly off of the state highway (within "say" ¼ mile).

  Examples:

The Seattle transfer station at Holden St. in south Seattle is a difficult site to find because of the surface street layout. Plaque signing would be allowed for this location subject to the City installing better follow-through signs and matching the new signing guidelines.

- To qualify for a "Refuse Station" sign the site must be a county or city owned refuse station. Private refuse stations will not be signed. The site must also be a major refuse station, not just a drop-off location.

- The refuse station sign shall be a plaque sign. Plaque signing would be subject to available plaque space. Stand-alone signs will not be allowed. An exception may be made if there are no free standing signs at the specific intersection.

- The sign is considered a general information sign. The color, therefore, would be white on green. The plaque may be placed on any stand-alone sign that has room at that particular intersection.

- The plaque size would be limited to 24 inches by 24 inches (refer to the MUTCD Section 2D-45 General Service Signs)

- Signing for recycling centers will not be allowed even if operated by a local agency. If a recycling center is part of a local agency's refuse station, the local agency can install a recycling centerline message on its "follow through" sign, if a follow through sign is needed.

- In lieu of a highway "refuse station" sign, a city or county may install a stand-alone "refuse station" sign on its side of an intersection right-of-way line. The sign would be considered a Type 1 sign.

VVK:vk RB_F_RefuseStation1.doc

DRAFT

Rideshare Signing

Revised 4-15-2002

LEGEND - WHITE (REFL)
BACKGROUND - BLUE (REFL)
LOGO - YELLOW (REFL)
CODE A - 60"X36" with 6"D * (30% REDUCED SPACING)
CODE B - 36"X24" with 4"D* (30% REDUCED SPACING)

Forward:

The Office of Urban Mobility (OUM) initiated a region wide rideshare signing program. Signs were installed during the winter 1996 time frame on I-5, I-90 and I-405 mainline roadways. These signs replaced the carpool signs at those locations.

In the late 1998 time frame OUM began a second round of rideshare sign replacements. A number of complaints had been received concerning the first round signing. The complaints centered around two main points:

The loss of valuable mainline sign space.
The current signs had too much information and not enough color contrast on them.

An agreement was reached with OUM to start placing the signs on the freeway on-ramps rather than the mainline and a revision of the three-color layout to a two-color layout that met MUTCD guidelines. A limited number of the new signs were installed on various freeway on-ramps during the early 1999 time frame.

NWR – Traffic Operations Guidelines:

- All rideshare signs shall be a two-color layout rather than the previous (pre-1999) three-color layout. The old style signs will be replaced as time permits.

  The old style signs can be still be used on country roads and city streets, exclusive of state highways.

- Sign locations -
  Freeway mainline sign installations are discouraged, due to sign spacing and sign overload problems.
  Sign placements on freeway on-ramps are acceptable.
  Sign placement on conventional 2-lane roadways is acceptable as long as there is sufficient signing room.
  Sign placements at Park and Ride lots are acceptable.
  These signs are considered low priority signs and can be removed if the space is needed for a higher priority sign.

- Sign spacing -
  Rideshare signs are considered to be incidental signs.
  Use a 300-foot spacing between signs on conventional 2-lane, high-speed roadways.
  Use a 150-foot spacing for freeway on-ramps, multilane and 2-lane, low speed roadways in incorporated areas.

- Signing costs -
  If requested by a local agency, local transit agency, etc., the requesting agency will be responsible for all costs. This includes sign fabrication, and initial installation. Cost reimbursement will be processed through a JA Account. WSDOT will be responsible for the sign maintenance.

  Please note that the requesting agency will not be allowed to install any signing on state right-of-way.

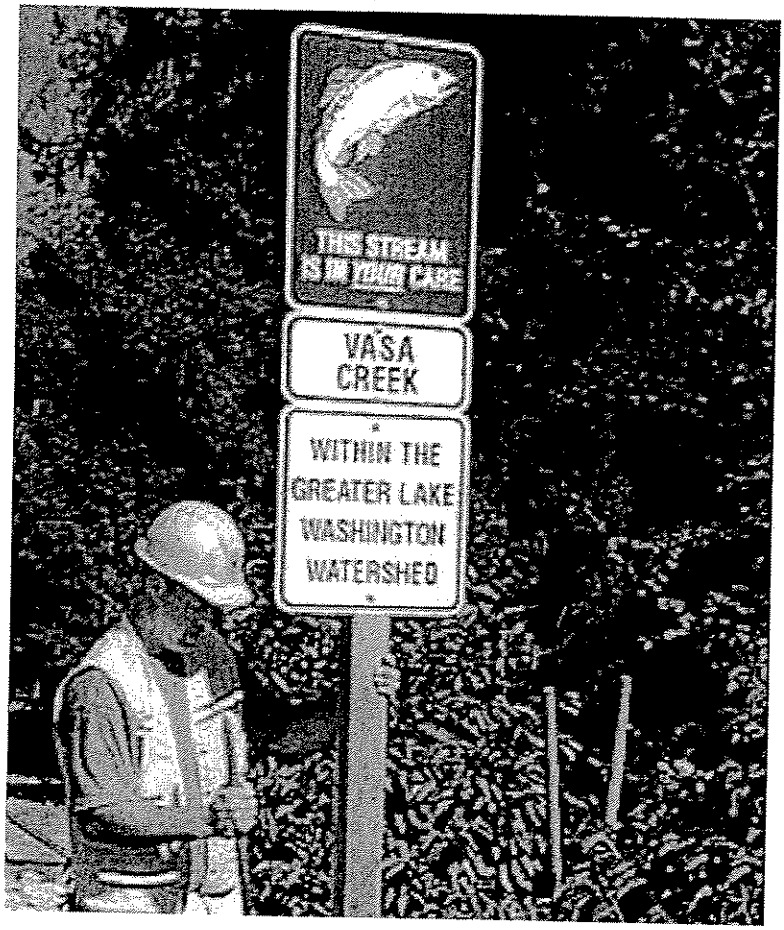
VVK:vk RB_F_Rideshare1.doc

DRAFT

Salmon and Fish Related Signing

(guidelines include information about the exclusion of wellhead, watershed, water conservation, water preservation and other water related signing)

Revised 4-15-2002



Salmon or fish related signing might be allowed, if it meets the guidelines below.

Stream name signing might be allowed, if it meets the stream name criteria guidelines.

Watershed signing is **NOT ALLOWED** either as a plaque to this sign or as a stand-alone sign.

Background Information:

The proliferation of various salmon, fish, stream and other water related signing has necessitated implementation of more restrictive signing guidelines in order to limit the number and type of signs being installed on state highways within the Northwest Region.

One of the principal guidelines for highway signing is that a sign should provide guidance for the motorist to complete his/her journey. At times, general information signs may be of value in providing motorist information that is not necessarily guidance related but is of value in providing information specific to some location. Information signs can include such items as state lines, city limits or other political boundaries, landmarks and other similar items of geographical interest.

Stream and fish related signing has been allowed in the past, but the different types of signing and the rational for such signing need to be defined better to see if such signing serves a general public awareness versus a specific user group's desires.

A series of meetings have been held with the OSC Traffic Section and other regional traffic staff to discuss stream and fish related signing guidelines. The reader is referred to the stream name signing guidelines for information on what stream signing will be allowed. Salmon and other fish related signing along with other non-germane water related signing are addressed in these guidelines.

Please note that "Salmon" signing will be allowed under the assumption that legislative action will be forthcoming on preserving the salmon habitat. The action would probably include some form of informational signing. These guidelines will be modified as necessary, if such a sign is supposed to be uniform and consistent throughout the state.

Salmon / Fish Related Signing Guidelines:

- A salmon or fish related sign might be installed at a stream crossing or other body of water if the sign is related to preserving the endangered fish habitat.

- Only one such sign will be allowed for a specific stream crossing or other body of water. Multiple signs supported, endorsed or maintained by different user groups will not be allowed. Examples would be where salmon, steelhead and trout user groups each want a specific sign for the same location.

- Only one type of sign will be allowed along a state highway corridor. Multiple types will not be allowed unless there are distinctly different water areas that would permit a different type of sign for each water area.

- Due to the number of requests from different user groups for signing on the same highway, WSDOT suggests that the different user groups work together in developing a single salmon or fish related sign message and have that sign message supported and sponsored by the local jurisdiction. An overall signing plan with support documentation should be submitted, preferably by the local jurisdiction or by an official organization or agency.

- The requesting user group will be responsible for the sign fabrication, all initial installation costs and any subsequent maintenance costs via a JA Account. Maintenance costs will include replacement

signing necessitated by blow-downs or other forms of vandalism. WSDOT personnel will be responsible for installing and removing any such signing and bill the user group accordingly via the JA Account.

- The stream crossing or body of water must be a year round crossing or body of water.

- Sign size will be limited to 18 inches x 2 feet, 2 x 2 feet or 2x 3 feet subject to the type of fish clipart and line message approved by WSDOT. The sign material shall be aluminum.

- Sign colors should be limited to the general informational signing colors of white and blue.

- Sign locations will be based upon available sign space and other higher priority signing needs. A salmon sign will be considered an incidental sign and can be placed within 300 feet of a major or minor sign on high speed highways (behind, not in front) and 150 feet of a major or minor sign on a low speed highway (behind, not in front).

Other Water Related Signing Guidelines:

The OSC Traffic Section's position has been that all other water related signing (listed below) does not provide a service to motorists and consume valuable sign space. These signs are viewed as unwarranted traffic generators and should not be installed on any state highway.

- Signs that are not considered appropriate on state highways –
  - Conservation District Boundary Area
  - Drainage Basin
  - Drinking and Ground Water Management Area
  - Groundwater Protection Region or Area
  - Groundwater Conservation Region or Area
  - Surface Water Management Area
  - Watershed signs (this includes entering/leaving signs)
  - Wellhead Protection Area

- The above-mentioned signs can be treated as Type 1 signs, per WAC 468-66-050 and be installed off the state right-of-way. Such signing needs to be supported by an official agency or organization and be documented (plan).

- Any approved off right-of-way signs should be limited to 36 x 48 inches, be aluminum material, and use white and blue colors.

VVK:vk RB_F_SalmonSigns1.doc

DRAFT

Schools: Marked Crosswalk Signing, Crosswalk Speed Zone Signing; And, School Area Speed Zone Signing

Revised 4/15/2002

Background Information:

With the advent of the 1999 fluorescent yellow green (FYG) school-signing program, the NWR- Traffic Operations Group began a comprehensive review of its existing school signing inventory for the 1999/2000 school year. Based upon the school walk route plans in-hand at that time, a region wide striping and signing program began to establish uniform and consistent school striping and signing. This work was completed by the end of 2001.

Starting with Year 2002 the Traffic Operations Group will begin addressing school bus stop approvals, school bus stop signing, school flashers, and the school S1-1 signing adjustments as defined in the 2000 Edition of the MUTCD.

General Guidelines:

Listed below is a summary of school related signing / striping guidelines and information.

MUTCD (1998 Edition):

- Sign lettering (Section 7B-3) -
  All lettering shall be in upper-case letters.

- School Advance Sign (Section 7B-9; sign number S1-1) -
  For use in advance of locations where school buildings or grounds are adjacent to the highway.
  It may be used in advance of established school crossings not adjacent to a school ground.
  The sign shall be used in advance of any S2-1 school crossing sign installation.
  Where used the sign shall be erected not less than 150 feet nor more than 700 feet in advance of the school grounds or school crossing.

- School Crossing Sign (Section 7B-10; sign number S2-1) -
  For use at established crossings including signalized locations.

  Exception -This sign should be omitted at crossings controlled by stop signs.
  This sign shall be erected at the crosswalk, or at the minimum distance possible in advance of the crosswalk.

- School Bus Stop Ahead Sign (Section 7B-11; sign number S3-1)-
  For use in advance of locations where a school bus is not visible for a distance of 500 feet.
  This sign is not to be used at every school bus stop, but only where there is no opportunity to relocate the stop to another location with adequate visibility.
  This sign shall have a minimum height and width of 30 inches in size.

- School Speed Limit Signs (Section 7B-12; sign numbers S4-1 to S4-4 and S5-1 to S5-2) -
  School speed limit signs shall be used to indicate the speed limit where a reduced speed zone has been established (in accordance with law, after an engineering and traffic investigation) or where a speed limit is specified for such areas by statute.
  S4 series bottom panels are 24 inches by 8 inches.
  S5-1 school speed limit sign is 24 inches in length by 48 inches in height.
  The end of an authorized and posted school speed zone shall be marked with a standard speed limit sign showing the speed limit for the section of highway which follows or with an "End School Zone" sign.
  S5-2 "End School Zone" sign is 24 inches by 30 inches.

Applicable Washington State Laws and Administrative Codes:

- RCW 46.61.250 Pedestrians on Roadways

- RCW 46.61.440 Maximum Speed Limit when Passing School or Playground Crosswalks -
  Sets a maximum speed limit of 20 mph either inside or outside incorporated areas when passing any marked school or playground crosswalk when such marked crosswalk is fully posted with standard school or playground crosswalk signing.
  The speed zone at the crosswalk shall extend 300 hundred feet in either direction from the marked crosswalk.
  Double the fine penalty as assessed under RCW 46.63.110.

- RCW 46.61.570 prohibits parking within 20 feet of a crosswalk.

- WAC 392-151-025 Walk Route Plans -
  The school district transportation director is responsible for the development of a walk route plan for each elementary school that has students who walk to and from school. The walk route plan shall limit the number of school crossings so that students move through the crossings in groups.

This WAC mandates the preparation of a route plan for all elementary schools that have students walking to and from the schools. The plan should be signed and dated by either the school transportation director or principal and sent to the NWR Traffic Operations Group for concurrence on those items affecting a state highway.

The reader is referred to the Guidebook for Student Pedestrian Safety Final Report dated August 1996 for additional information on school route plan preparation. One statement on page 92 of the guidebook states that marked crosswalks should not be installed along a school route unless the school district commits to providing an adult crossing guard or school safety patrol when children are walking to and from school.

- WAC 392-151-030 Controlled Crossings -
  "School Patrol Controlled" crosswalks are defined as any crosswalk which is attended by a student or adult guard, and which is not controlled by a traffic signal or stop sign. At a minimum these crosswalks shall have the S1-1 and S2-1 signs; be marked crosswalks; and, have a posted 20 mph speed limit sign.

  "School Patrol Assisted" crosswalks are defined as any crosswalk, which is attended by a student or adult guard and controlled by a stop sign, traffic signal or law enforcement officer. When crossings are controlled by stop signs the S2-1 (school crosswalk) sign may be omitted. The use of a school speed limit sign may be necessary following an engineering study.

  The school authorities shall contact the governmental agency having jurisdiction over the street or highway in question. The Department of Transportation shall be contacted on all state highways outside of incorporated areas and within incorporated areas having a population of 22,500 or less.

- WAC 468-95-060 When Children are Present -
  Defines when a motorist shall stop at marked crosswalks when children are present.

Headquarters Traffic -Traffic Manual:

- Mark the end of the posted school zone with a standard speed limit sign (sign number R2-1) for the section of highway that follows.
  Note: An "End School Zone" sign (S5-2) will be listed as an acceptable alternative in the next traffic manual revision.

- In addition to the bottom panel legends given in Section 7B-12 MUTCD, WAC 392-151-035 identifies "When Flagged" (S4-5) and "When Flashing" (S4-4a) as acceptable alternates.

- Established school crossings not controlled by a stop sign shall be signed with a school crossing sign and a school advance sign in accordance with the MUTCD.

- The new Fluorescent Yellow Green (FYG) signing colors may only be used on the following sign types:

S1-1 and S2-1 (school children) symbol signs
S4-3 "School" panel
S5-1 and S5-101 "School" panel part of the school speed limit signs
(Existing S5-1 and S5-10l signs can be modified by placing FYG aluminum overlay panels over the "School" line message.)

Headquarters Traffic – Supplemental Information:

- A calendar action (traffic regulation) is not required for the installation of 20 mph school speed zones related to marked school crosswalks.

- A calendar action (traffic regulation) is required for the setting of any school area speed zone (not related to a marked school crosswalk). A school area speed zone will require an engineering study. A school area speed zone will be in part based upon the various traffic calming measures that may be agreed upon to help reduce operational speeds; and, the voluntary compliance that can be expected from motorists. At present, only the school grounds that abut a state highway can be considered for a school area speed zone. This may change when the State Traffic Engineer reviews the results of several demonstration projects.

- The preferred legend priority (in descending order) for the bottom panel legend of a school speed limit sign is:
  "When Flashing" - This plaque is to be used when there are flashers mounted on the sign installation. The flashers can only be in operation during school hours. Flashers cannot be in operation during non-school hours.

  "When Flagged" - This plaque requires the placement of two orange flags on the sign. The flags are to be used only during school hours.

  Time plaque - The plaque message would state the school hours such as "On School days / Mon-Fri / 8:30 AM to 7:00 AM to 8:30 AM / 2:30 AM to 3:30 PM".

  "When Children Are Present" - This plaque message has had several interpretations. Headquarters Traffic states that the plaque message is applicable 7 days a week for 24 hours a day including the summer time frame, if the plaque is not covered.

- WSDOT will not install any double the fine signs for speeding within school area speed zones.

- Sign sizes:

  Conventional roadways - Standard size will be 36" x 36" for both urban and rural.
  The minimum size will be 30" x 30" and may be used where the speeds are less than 35 mph.

  A 48" x 48" size sign may be used where there is a need for increased emphasis. An engineering study must be conducted to justify the use of this size sign.
  (There really can't be school zones on access-controlled freeways/expressways)

- If a school commits to having a school crosswalk guard, we will have to install the crosswalk signing as noted in the WAC. However, we are not required to install such signing, if a school does not commit to having a crossing guard.

- The 500 ft. distance criteria for the school bus ahead sign are under review by Headquarters Traffic and the FHWA. These distance criteria may be changed sometime in the future (to match the distances shown in Table ll-1 of the MUTCD).

- The reader is referred to the Pedestrian Facilities Guidebook dated September 1997 for additional information on school related traffic calming measures, site design, safety considerations, etc.

NWR -Traffic Operations Supplemental Information:

- The NWR- Traffic Operations Group is now issuing an annual letter (July / August time frame) to all the school districts within the region asking the school districts if they have any school related signing or pavement marking work that needs to be done for the upcoming school year. This includes any additional bus stop signing or the removal of existing bus stop signing, etc.

- In order to properly address any school related signing and/or striping, each school district must submit a school route plan signed and dated by either the school district transportation director or the principal to the NWR- Traffic Operations Group for approval and concurrence. The plan should be submitted on a yearly basis (in the August / October time frame). If the plan has not changed from the previous year's submittal, that particular school district could reference the previous year's plan as being the current school year plan.

  If a school states that it is bussing all of its students, the school should submit a signed letter documenting that fact.

- The priority of any school related striping and signing work that will be done in the August/October time frame will be:

  1st priority - Elementary schools
  2nd priority - Junior high or middle schools
  3rd priority - High schools

  Normally, we will not install any school related signing or striping for college level schools unless there is a safety related problem.

- The NWR will use the "**End School Zone**" as the standard sign for defining the end of a school speed zone.

- In keeping with the MUTCD and the Headquarters Traffic Manual, the NWR will not:
  Install the S2-1 (school crosswalk) signs at stop-controlled intersections;
  Install 20 mph speed signs for marked crosswalks at stop controlled and signaled controlled intersections unless the signs are warranted through an engineering study; or

Install "Reduced Speed Limit Ahead" signs at school crosswalks or school area speed zones. The reduce speed limit sign may be used, if an engineering study justifies its use. If used, the school speed zone ahead sign would consist of the "Reduced Speed Ahead" sign (R5-2a) with a FYG "School" plaque (S4-3) mounted directly above it.

- The NWR Traffic Operations Group has created a set of four generic school signing layouts. Please refer to Section G of the NWR Traffic Operations RedBook for these drawings (Dwgs G-S1 to G-S3).

- The State Traffic Engineer is still evaluating if he will approve any school area speed zones on state highways (as a statewide policy). He has allowed the NWR to consider the following speed zone criteria for use on a trial basis (for several selected schools):

  A school area speed zone may be considered based upon a speed differential of 10 mph below the operational speed or 5 mph below the posted speed limit. A further speed zone reduction of 5 to 10 mph may be considered, if supported by an Engineering Study, school area accident history involving school children, school driveway accident history or the implementation of certain school area traffic calming measures.

- The Department considers the following items as being extraordinary devices and will not normally pay for the procurement, installation and maintenance costs of these items as a standard practice.

  1. Pavement marking legends with SCHOOL or SLOW message.

  2. Overhead signing with crosswalk or school messages

  3. Overhead beacons (flashers) associated with static school signs.

  4. Shoulder mounted beacons (flashers) associated with static school signs.

  The NWR does not make any allowance for Item #1 at all. If a school requests either Items 2, 3 or 4 and agrees to pay all the associated procurement, installation and maintenance costs, the NWR will consider those items. Please see the School Flasher guidelines for additional information on "flashers".

VVK:vk RB_F_School2.doc

SCHOOL

SPEED
LIMIT
20

ON SCHOOL DAYS
MON - FRI
7:00AM TO 8:30AM
AND
2:30PM TO 3:30PM

DRAFT

School Flasher Guidelines

Revised 4/15/2002

- School flashers are considered to be extraordinary traffic safety devices. As such, WSDOT does not normally install these types of safety devices at its cost. Flashers can be installed, if a school requests flashers and agrees to pay for the initial installation costs and any maintenance cost via a JA Account.

- If flashers are installed, they can only operate between a one to two hour time frame in both the AM and PM time periods (when children are coming to and going from the school). The school transportation supervisor will be given charge of the flasher operation. If the school operates the flashers outside of the agreed upon time frames, the flashers will be removed. The school would have to go through another agreement and JA Account process to reinstall the flashers.

- Flashers may be used at approved school crosswalks. The 20 mph school speed limit sign would use the FYG "When Flashing" line message). The speed limit signs (with flashers) are set 300 feet each side of a crosswalk (as prescribed per RCW).

- Flashers may be considered at a school's bus driveway delivery point. The State Traffic Engineer may approve a school area speed zone for the driveway area on a case-by-case basis. The speed zone criteria he is currently allowing us to use a speed differential of 10 mph below the operational speed or 5 mph below the posted speed limit. A further speed zone reduction of 5 to 10 mph may be considered, if supported by an Engineering Study or a school driveway accident history or the implementation of certain traffic calming measures.

  The speed limit signs (with flashers) will normally be set 300 feet each side of the school driveway similar to the distance criteria for school crosswalks.

- Shoulder mount flashers are the preferred type of flashers. Overhead flashers are discouraged.

- Flashers should employ LEDs and be solar powered. Solar power units allow for a greater degree of installation flexibility versus the limitations created when using hard wire power drops.

If external power is required, a separate electrical service (separate from the state service) will have to be provided. The school will be responsible for the electrical hookup costs and for the monthly electrical service charges.

- Flasher operation control should be with a waterproof key switch mounted on each post holding a sign and flasher.

  If a school requests remote control from inside the school, it shall be the school's responsibility to hire a licensed electrical contractor to provide the system installations.

  Prior to installation, the electrical plans should be reviewed and approved by both WSDOT Electrical Design and L&I, as the control system will be installed off of state right of way.

- WSDOT shoulder mount flasher installation costs:
  Sign post installation –
  The NWR will usually pay this cost unless the post installation is an unusual installation.

  Flasher unit -
  Year 2002 nominal costs for

Labor at $50 per hour with a four hour minimum sign charge	= $200 per sign
Electrical equipment charges	= $100 per sign

- Electrical hook-up costs will vary depending upon the type of hook-up.
  Solar power units can be purchased from suppliers such as K&K Systems (www.kksystems.com/hazard.html)
  K&K Systems November 2000 price list:

Model 116 (single yellow flasher/one 80 watt solar panel) -	$1,925
Model 118 (double yellow flasher/ two 80 watt solar panels) -	$3,125
Remote turn-on/off units up to 1,250 distance -	$350 per sign

VVK:vk RB_F_school flashers1.doc

DRAFT

Seat Belt Signing

Revised 4/15/2002

Forward:

The previous seat belt signing program has ended and all of the sign installations should be removed. A new seat belt program has been initiated.

The Headquarters Traffic Section will be issuing its statewide guidelines within the next two weeks. The NWR guidelines will be modified as necessary to reflect the OSC requirements.

- Sites chosen for the public information signing will be considered as permanent sites for use by the Washington Traffic Safety Commission (WTSC). The WTSC can add, delete, rotate, etc. any of its public information signs as it wishes. The nominal sign message service life will be 6 months, but can be extended indefinitely. The WTSC will be responsible for funding any signing changes. All WTSC signing revision requests must be processed through the NWR Traffic - Regional Operations Section.

- The nominal sign message service life being considered for the new seat belt signs will be two years. The WTSC may decide on installing different public information signs at the permanent site locations before that time period is up.

- This type of sign will be considered a minor sign and should have 500 ft spacing between signs.

- Snow zones - Gateway sign locations should be placed outside the snow zone areas if at all possible. For example the SR 20 WB gateway area sign being considered by the NWR Operations Section would have been in the Newhalem vicinity. OSC Traffic has requested that this gateway sign be placed somewhere between Rockport and Marblemount

- Indian Reservations – Do not place these signs within Indian reservation areas.

- Sign installation due date – The signs should be installed by the end of June 2002 with a 'drop dead' date of July 15th.

- NWR Traffic - Regional Operations Section will maintain a small sign reserve at its Corson Ave sign shop for replacement usage.

- Regional Operations may consider issuing a color-coding sign location map, if time permits.

VVK:vk RB_F_SeatBelt1.doc

DRAFT

Shoulder Driving Restriction Signing

Revised 4-15-2002

R11-XXXX
11/01

Approved state law reminder shoulder driving restriction sign

Forward:

Shoulder driving is becoming more prevalent every day even though it is illegal. Local law enforcement agencies have been hesitant to issue citations without signing. Because illegal shoulder driving is a "Rule of the Road", signing is not necessary in order for a citation to be issued.

The Headquarters Traffic Section has stated that shoulder restriction signing should not be installed, as it will give the impression that shoulder driving is legal, if there are no restriction signs. Because of the on-going problem and subsequent complaints, the Headquarters Traffic Section has agreed to a limited usage of a new state law reminder sign. The sign is shown above.

NWR – Traffic Operations Guidelines:

- The use of the R11-501 sign (Do Not Drive On Shoulder) is strongly discouraged as it gives the impression that it is legal to drive on the shoulder if there are no restriction signs.

- Sign location –
  A new state law reminder sign has bee approved for use on a limited basis. The signs are not to be used wherever there is a site-specific shoulder-driving problem. They may be used as corridor reminder signs.

  Examples –

  SR 2 - One set of signs could be used at each incorporated area from Monroe to Gold Bar (one sign at each approach inside the incorporated limits).

  SR 20 - SR 20 safety corridor signing wherein one set may be placed between the SR 20 / SR 536 junction and the I-5 interchange, one set placed between Burlington and Sedro Wolley; one set at Sedro Wolley (one sign at each approach inside the incorporated limits).

  Reminder signs could be included in the border crossing sign layout and regional boundary areas.

- Sign spacing -
  The purpose of these signs is to impart a high impact value to the motorists, so the signs should have optimum spacing if possible.
  On 2-lane, high speed roadways consider a 500-foot spacing between signs.
  On 2-lane, low speed roadways consider a 300 foot desirable / 150 minimum spacing between signs.

- Restricted shoulder striping -
  At high abuse areas diagonal shoulder striping may be considered as an option. The NWR Traffic Operations Group would review and approve shoulder-striping requests on a case-by-case basis.

  Striping would consist of an 8 inch white diagonal line laid out on a 45-degree angle with a 10, 15, 25 or 50 foot spacing depending upon the length of the striping area. The line stripe would be done using a durable material ((MMA is the 1st choice and thermoplastic would be the 2nd choice).

  If there are no bicyclists or pedestrians to consider, each of the white diagonal lines could have an adjacent RPM line. This would add noise and a certain uncomfortable feel to motorists driving over the lines.

VVK:vk RB_F_ShldDrive1.doc

DRAFT

Special Event Signing

Revised 4-15-2002

NWR – Traffic CTCO and Operations Group Guidelines:

The NWR Traffic CTCO Group will normally review and issue permits for special event sign.

The NWR Operations Group acts in a support role for CTCO for the review of any sign sizing, sign message and sign spacing problems

- All special event signing should be shoulder-mounted signs. No overhead signs will be allowed. Overhead banners may be allowed on a case-by-case basis.

- Sign size, legend size, color scheme and logo (if any) must be approved in writing by both the CTCO and Operations Groups before a sign can be installed on a state highway.

- Special event signing should normally be stand alone signing and meet all of current sign installation guidelines. The nominal distance between special event signing and other highway signing is 800 ft., especially on interstate highways;
  500 feet on 2-lane, high speed conventional roadways; and,
  300 feet on multilane and 2-lane, low speed roadways in incorporated areas.

  If this spacing cannot be obtained, the Traffic Operations Group may allow a smaller distance on a case-by-case basis.

- Depending upon the type and size of the special event signing, it may be possible to attach the signs to existing sign installations. The special event signing may be attached to MIS and TOD sign installations. In some cases they may also be attached to guide directional signs, primarily to ramp guide directional signs. Such signing requests will be reviewed on a case-by-case basis. **Special event signing cannot be attached to any regulatory or warning signs.**

  If approved, the special event sign must be attached to the bottom of the MIS or TOD sign. The special event sign cannot be attached to the sides or top of the highway sign installation.

  The special event sign cannot exceed the width of the MIS or TOD sign that it is attached to.

  The special event sign cannot be mounted within 36 inches of the ground on interstate highways.

Sandwich board signs are not allowed on interstate highways. Sandwich boards may be allowed on non-interstate highways on a case-by-case basis. It is preferred that no sandwich board be allowed on any non-interstate or access controlled highway.

The special event sign color(s), letter sizing, logo, etc. cannot distract motorists from reading the MIS or TOD signing and must be sufficiently clear and understandable to the motorists so they are not overly distracted in trying to read the special event sign legend.

The special event signing must be constructed of easily breakable material so it will not create a hazard to a wayward vehicle i.e. it should be constructed of plastic, 1/2 inch plywood or thin gage aluminum. The signing cannot have any crossbeam attachment that would stiffen the sign and thereby create more of a hazard if struck by a wayward vehicle.

- Special event signing cannot be installed more than 7 days prior to the special event and must be removed within 10 days following the event. Due to liability problems WSDOT maintenance personnel must install and remove the signs. The special event organizer must pay the cost for the sign installation and removal through a JA account. A Letter of Understanding must be signed by the organizer agreeing to pay all of the costs and must be received by WSDOT before any sign installation work can be done.

VVK:vk RB_F_SpecialEvent1.doc

DRAFT

State Park Signing

Revised 4-15-2002

Background Information:

The Headquarters Traffic Section has issued an extensive amount of information with its January 2002 edition of the Traffic Manual. This information can be found in Chapter 2 Section D – Supplemental Guide Sign State Park. This information has negated much of the previous NWR Traffic Operations' State Park supplemental guidelines.

NWR – Traffic Operations Supplemental Guidelines:

- The Department will provide signing to "State Parks" from the nearest state highway.

  A state park can be signed on an interstate highway, if the park is within fifteen miles of the highway. The Department would be responsible for the installation of any follow-through signs on any state route that connects the interstate to the state park.

  On non-interstate highways that are not part of the connecting interstate signing, state parks will be signed from the nearest and most direct interchange or intersection. No advance highway mileage signing will be allowed for this condition.

  Please note that both RCW 47.36.290 and the Traffic Manual are silent on any distance requirements for signing from a non-interstate highway to a state park. Since other signing guidelines such as the MIS guidelines allow businesses to be signed as far out as 15 miles from a highway, we will use the 15 mile distance criteria for all state park highway signing.

- The State Parks will be responsible for the installation of any non-state highway follow-through signing. These signs must be installed prior to the installation of any highway signing.

- Sign spacing requirements –
  A state park sign is a supplemental guide directional sign and should meet the nominal spacing requirements listed below:
  800 foot spacing for interstate and multilane, high speed roadways.
  500 foot spacing for conventional 2-lane, high-speed roadways.
  300 foot spacing for multilane and 2-lane, low speed highways within incorporated areas.

- Sign color -

A state park sign is a recreational sign. All signing related to the state park should be white on brown in color.

- Recreational Symbols –
  Freeway signing should display only the state park name along with a directional arrow. Freeway ramp and conventional roadway signing may include a maximum of four recreational symbols.

  The symbols can be seasonal symbols. If the symbols are seasonal, a written agreement with the specific state park manager should be made outlining who will be responsible for changing the symbols. The parties to this agreement should be the state park manager, the local maintenance superintendent and Traffic Operations. The agreement should state who would be responsible for changing the symbols, the time frames for changing the symbols and any cost reimbursement that may be involved.

  "Beach" and "No Camping" line messages may be used in lieu of a symbol (April 3,1990 memorandum from Dave Peach). The line messages shall be contained within a 24 x 24 inch plaque

- Added signs or line messages –
  "Campground Full" signs (July 10, 1995 memorandum from Dave Peach) will allow state park personnel to install, maintain and remove these signs subject to review by the regional Traffic Operations Office.

  Signs can only be placed on ramps and conventional highways. It can be either a stand-alone sign or a changeable line message plaque placed under the ramp or conventional highway sign. These signs are not to be placed on freeway mainlines.

  The state park manager should send a written request to the Traffic Operations Group for such signing. Once a site has been agreed to, a written agreement should be made outlining who will be responsible for the signing. The parties to this agreement should include the state park manager, the local maintenance superintendent and Traffic Operations. The agreement should state who would be responsible for changing the sign or line message. State Parks will be responsible for all costs associated with this sign or line message. A JA Account should be set up to cover the fabrication, installation, maintenance and removal costs. The account would either be an "open" or "closed" account depending upon the agreement.

  Please note that the general statewide consensus is for the State Parks to pay for the fabrication and installation costs and be the party solely responsible for maintaining the signs or line messages.

VVK:vk RB_F_StatePark1.doc

DRAFT

Stream Name
(Water Crossing Name) Signing

Revised 4-15-2002

Forward:

These guidelines were developed in order to establish a uniform and consistent approach for the installation of stream related signs. Any NWR staff personnel who may be involved with the design, fabrication or installation of stream related signs should refer to these guidelines.

The guidelines may also provide useful information for those staff members who handle water related inquiries from the general public.

The guidelines address signing for rivers, streams, creeks and other bodies of water that may traverse or parallel a state highway. The generic name for such signing has been "Stream" signs, but "Water Crossing" signs may be a more appropriate term to use.

At the present time, signs such as wellhead protection signs, ground water protection signs, water quality signs, water district signs, etc. will not be permitted within state right-of-way. These signs can be placed adjacent to the state right-of-way line and would be considered as Type 1a signs (private property signs not requiring a permit).

Fish habitat signs may be permitted within the state right-of-way under certain conditions. The guidelines for this type of signing are being formulated under a separate set of guidelines.

Please note that the Headquarters Traffic Section and NWR Traffic Operations Group supplemental guideline are dynamic. Additions and deletions to the guidelines can and should be expected to occur.

MUTCD Guidelines:

The MUTCD treats stream signs as a general information sign (white on green colors). General information signs provide information of interest to the traveler, though not directly necessary for guidance. These signs should not be installed "within a series of guide directional signs or other equally critical locations, unless there are specific reasons for orienting the highway user or identifying control points for activities that are clearly in the public interest.

NWR- Traffic Operations Supplemental Guidelines:

Installation of stream (or water crossing signs) may be allowed under the following conditions:

- A stream name sign will be classified as an incidental sign. Nominal sign spacing criteria should be as follows:
  300 foot spacing on interstate and multilane, high speed roadways.
  150 foot spacing on conventional 2-lane, high-speed roadways.
  100 foot spacing on multilane and conventional 2-lane, low speed roadways within incorporated areas.

- A body of water that may traverse or parallel a state highway must be of a significant size wherein it is specifically identified by name on a USGS map (1: 100 scale or larger map).

- If the body of water traverses the highway, the width of the water way must be bridged by a highway structure.
  A single culvert crossing does not qualify for a stream sign.
  A seasonal stream crossing does not qualify for s stream sign.

- A stream sign cannot be installed if there is a sign overload (sign saturation) problem in the general vicinity of the stream.

- A stream sign cannot be installed if it interferes or is a distraction with other adjacent signs.

- The stream sign specifications should be taken from the 13-101 sign series for the CODE A specifications only. (Sign height will be limited to 24 inches with the sign width being variable; sign color will be white on green; letter height will be 6" upper case and 4-1/2" lower case letters.)
  Please do not use the Code B specifications, unless approved by the NWR Traffic Operations Group.
  The wording of a stream sign can reflect the body of water's name, such as Lake Washington, S. Fork Snoqualmie River, Ebey Slough, etc.

- Existing stream signing that do not meet the above criteria may be left in place until:
  a. A construction project is developed for the area wherein highway signing is a contract item. At that point in time, the stream sign should be removed and not replaced.
  Or
  b. The sign has been vandalized or deteriorated to such a point that the local maintenance area needs to replace the sign. At that point in time, the stream sign should be removed and not replaced.

VVK:vk RB_F_StreamName1.doc

DRAFT

Street Name Signing

Revised 4-15-2002

Forward:

The assembly of these guidelines was done in order to provide a guideline summary to those NWR staff personnel who may be involved with the design, fabrication or installation of street name signs. This summary may also provide useful information for those staff members who handle street name sign inquiries from the general public.

Please note that the Headquarters and NWR Traffic Operations supplemental guideline sections are dynamic. Additions and deletions to these sections can and should be expected to occur.

MUTCD (Section 2D-39) -

- Min. letter height shall be 4 inches.
- Supplementary letters such as Street, Avenue, Road, etc. may be smaller. Min. height shall be 2 inches.
- Conventional abbreviations are acceptable.
- Government related identification should be on the left side of the sign.
- Sign colors should be contrasting colors.
- Sign colors should be white on green.
- Sign street name face shall be parallel to the street the sign names.
- In residential areas at least one street name sign should be installed at an intersection *(OSC/NWR -on the far right hand side in the ascending milepost direction).*
- In urban business areas, main arterials, etc. two street name signs should be installed at an intersection *(OSC-NWR -on the far right hand side, diagonally opposite one another in the ascending/descending milepost direction).*

- Supplemental street name signs may be erected in advance either separately or below an intersection related warning sign.

Headquarters Traffic Information -

- Please use the following "Street Name Letter Size" requirements and WSDOT "Sign Fabrication Numbers". The information listed below is in agreement with the new MUTCD guidelines.

Lane Type	Speed Limit	At I/S Letter Size	Advance Letter Size	Sign Fab. Numbers
Single	25-30 mph	4" (D)	N/A	D3-l01 or D3-l02
Single & Multi-Lane	35-45 mph	6" (D)	6" (D)	D3-l01 *, D3-l02, D3-30l or D3-302 (Advance Only)
Single & Multi-Lane	50+ mph	6" (D)	8" (D)	D3-l01 *, D3-l02, D3-30l or D3-302 (Advance Only)**

For advance locations associated with a crossroad warning sign use a D3-20l.
* The 8"D and 6"D letter size combination is for signs mounted on signal mast arms or advance locations.
** Modify to use 8"D letters and increase the sign height to 18" for one line or to 30" for two lines.

- Shoulder mounted street name sign length should be 60 inches or less.
- When city streets are part of the state highways, the appropriate city shall install and maintain the street name signs within the corporate limits.
  NOTE: An exception to the above criteria is when a street name sign is attached to a signal pole that is owned and maintained by WSDOT. In this case, the city shall work with WSDOT on any necessary street name signing revision and reimburse WSDOT for any sign installation cost incurred by the Department.
- Where county roads intersect state highways, the counties are responsible for the initial sign installation (above WSDOT's stop signs), and then by agreement WSDOT will maintain the signs. *(Historically, the NWR has usually borne the cost of a single street name sign request change and installed the sign. On multiple street name signing request changes the local agency would be expected to pay all the associated costs with WSDOT fabricating and installing the signs.)*
- Private street name signs are the responsibility of the property owners to install and maintain via a general permit with the local maintenance area. *(The NWR Traffic Operations Group has developed a typical sign layout drawing that should be included with the general permit.)*

Sign Fabrication Manual -

D3-101	Street name sign with border, white on green reflective colors (8 to 16 inch height).
D3-104	Private street name sign with no border, white on green reflective colors (12" height).
D3-201	Supplemental advance street name sign placed below an intersection warning sign; sign has no borders, black non-reflective/yellow reflective colors (6 to 12 inch height). Please note that this sign should not be placed above the intersection warning sign.
D3-301	Street name sign with border, white on green reflective colors (12 inch height).
D3-302	Advance street name signs with border, white on green reflective colors (12 & 24 inch height).

OSC -Traffic Operations Supplemental Guidelines -

- Sign letter font used is the FHWA - Highway Gothic font.
- Sign sheeting material should be Type II (Super Engineering Grade) for shoulder mount street name signs (for both the foreground and background colors).
- Sign sheeting material should be Type III (High Intensity Grade) for any mast arm mounted street name sign (for both the foreground and background colors). Cities can use diamond grade sheeting material for their street name signs. Whatever grade sheeting material is used it should be the same for both the foreground and background colors. WSDOT can fabricate the street sign message for a city, if the city is willing to pay the fabrication cost. Diamond grade sheeting will require an "ok" from OSC Traffic before the Yakima Sign Shop would use that sheeting material.
- Some county agencies have been installing black on yellow street name signs of various dimensions. These signs are supposed to be white on green signs meeting the MUTCD and WSDOT Traffic Manual guidelines. When any of these signs are being replaced by WSDOT, the replacement signs should be in conformance to the current MUTCD and WSDOT Traffic Manual guidelines.
- There are no definitive guidelines on where a single street name, shoulder mounted sign should be placed. If a single street name, shoulder mounted sign is installed; it must be a double-sided sign. Please refer back to the MUTCD Section for the OSC/NWR suggested location for the placement of these signs.

NWR- Traffic Operations Supplemental Guidelines:

- **D3-101 sign** –

  In the past several different sign sizes were used in relationship to the D3-101 signs. This included a modified D3-101 sign that had no borders (a 9" high sign with SD or C letter size). Because OSC has increased the sign height to 12 inches and letter height to 6D, the previous NWR street name guidelines are no longer valid and should be discarded.

  6C letter size can be an option in order to keep the sign width to 60 inches or less.

- **D3-301 sign** -
  This sign is to be used at major intersections and can be mounted on signal mast arms. For signal mast arms the sign should be 18 inches high. The "George" head should be 10 7/8 inches wide by 12 inches high..

  6C letter size can be an option in order to keep the sign width to 60 inches or less.

- **County crossroad street name signs** –

  Historically, the NWR has paid for the cost and installation of (shoulder mounted) county street name signs. We also have not asked for any street name sign maintenance agreements. We plan to continue this practice. Due to the higher costs associated with signal mounted street name signs, the county will always be expected to pay these costs via a JA Account.

  If the county requests a street name sign change, we may ask them to pay for the costs if the name change is the result of a county initiated action such as a county ordinance to rename streets, etc.

  NOTE: The *Thomas Guide* and the *Totem Atlas* street maps do not always reflect the official street names. If a street has been signed incorrectly, we will change the street name sign upon a written request from the local agency. The local agency may be asked to pay the associated costs, if the incorrect street name sign is not attributed to WSDOT's action or is the result of a county initiated street name change.

  If we replace a non-conforming county street name sign with a conforming street name sign (in regards to color and size), we should give a 'heads-up' to the county or maintenance sign technician who installed the sign as to the reason why we are changing the sign.

- **Mast arm signs** -

  All mast arm signs normally require a wind loading review by the OSC Bridge and Structures Division. Retrofitting existing mast arm signs with sign heights greater than 18 inches or signs longer than 60 inches will require wind-loading reviews by the OSC Bridge Section. Wind loading reviews may take 30 to 180 days to complete depending upon the work backlog and the amount of review work involved.

Wind loading requests should be processed through the NWR Traffic Electrical Design Group via the NWR Traffic Operations Group. The Electrical Design Group will assist the Traffic Operations Group in collecting contract data, providing sign dimension information and location data for the wind loading review package that would be sent to OSC Bridge. The data collection may take 15 to 30 days depending upon the work backlog.

Mast arm signs should not be banded. These signs should be mounted using mast arm signing clamps (in order to prevent sign rotation in heavy winds).

All mast arm street name signs within a highway corridor section should be of the same size dimension, same message layout and same letter height. (Different sign sizes, different message layouts and letter heights may confuse the motorists). The mast arm sign dimensions should be based upon the shortest 'clear area' distance of the various signal mast arms under consideration. Please note that a 2 ft clear zone should be maintained around any signal head in order to allow easy access to the signal head. A six-inch clear zone should be maintained between the sign and the mast arm/pole connection.

All mast arm street name sign messages should have the same message layout as any adjacent guide directional street name message layout.

All mast arm signs, on state owned signal poles, will be installed and maintained by WSDOT with the local agency paying all associated costs for any signing revision initiated by the local agency.

- **Private street name signs** -

A private street name sign cannot be installed on state right-of-way unless the proposed street name has been approved by the appropriate county or city. The property owner shall submit an acceptance letter to the Department showing the county or city's approval of the proposed street name. The letter should be included as part of the development plan or street name installation request.

All signage and striping for private roadways or driveways shall be the responsibility of the property owner(s) using that facility. The property owner(s) should be notified during the access review stage of their responsibility. These items of responsibility should also be so noted in the access permit or developer agreement.

Initial installation and maintenance responsibility will include:

Street name sign (which includes the supplemental line message "private").
Stop sign, if the facility is a private road.
Stop bar, if the facility is a private road.
Centerline stripe at the stop bar, if the facility is a private road.
All signing shall meet WSDOT signing requirements.
All striping shall meet WSDOT striping requirements.

It will also be the responsibility of the property owner(s) to address any concerns from the United States Postal Service or any emergency service in regards to the private street signing.

VVK:vk RB_F_Street-Name1.doc

DRAFT

Transit and School Bus Stops on State Highways

Revised 4/15/2002

Transit Stops:

- All transit stops on state highways must be approved by the Region Traffic Engineer, exclusive of non-limited access control highways in incorporated areas.

- Transit stops on non-limited access state highways within incorporated areas are approved by the respective local jurisdiction. The NWR Traffic Operations Group will normally work with cities and towns, with a population under 22,500, on the review and approval of those transit stops.

- If a state or a developer design project contains a transit stop, a site specific bus stop approval letter must be included with the PS&E Channelization plan or the developer plan before that plan can receive final approval from the Region Traffic Manager.

  Contact the NWR Traffic Operations Group for conducting site-specific transit stop reviews and the processing of the transit stop approval requests.

- All transit stops should be transit pullouts meeting either the NWR Traffic Operations Group Interim Bus Stop Guidelines dated February 1998 or the WSDOT Transit Vehicle Stop Zone Guidelines dated 1999. The WSDOT Transit Stop Guidelines are based upon the NWR Bus Stop Guidelines.

- State law does not allow in-lane transit stops. The NWR Traffic Engineer can give temporary approval for a site-specific location, if sufficient justification has been provided on why the stop cannot be a pullout.

- Transit pullouts shall be striped using the NWR Traffic Operations striping guidelines found in Section G of the RedBook (Dwg. Nos. G-T1 to G-T3).

- The transit stop approval inventory can be found in Section I of the RedBook.

School Bus Stops:

- The Region Traffic Engineer must approve all school bus stops on limited access facilities.

- All school bus stops requiring an advance school bus sign must be reviewed and approved by the NWR Traffic Operations Group. Please note that the need for an advance school bus sign should be reviewed on a yearly basis as the need for such signs may change on a yearly basis.

- The school walk-route signing and striping inventory and the school bus stop inventory can be found in Section I of the RedBook.

VVK:vk RB_F_Transitstops1.doc

DRAFT

Transit Flyer Stop and Direct Access Connection Striping and Signing

Revised 4-15-2002

Background Information:

Mainline transit flyer stops and transit/HOV direct access connections are intended for the use of the transit agencies and HOV motorists. Neither the MUTCD nor the Headquarters Traffic Manual address the signing and striping for these two items. The NWR Traffic Operations guidelines are provided as an aid in achieving striping and signing uniformity for the mainline flyer stops and direct access connections.

The NWR Traffic Operations Group has been receiving requests and inquiries from the transit agencies and the WSP to establish uniform signing and striping at these locations in an effort to better inform motorists about the restricted areas, when they use them for bypassing traffic queues.

NWR – Traffic Operations Guidelines:

Flyer Stop Guidelines:

- A "Restricted Lane / Transit only" sign should be installed at the 'transit only' flyer stop off-ramp entrance. The sign should be placed at the mid-point of the off-ramp taper section in the shoulder area.

- A 4 inch white solid MMA (or thermoplastic) edge line will be installed across the transit only ramp entrance.

- 8 inch white MMA (or thermoplastic) diagonal lines (with RPM's) should be installed in the 'transit only' gore point areas.

  The diagonal gore lines are to provide additional guidance to support one-directional movement so that the main traffic flow stays to either the left or right of the gore point. Do not use gore point chevrons, as they are to provide guidance for a two-directional movement.

- A "TRANSIT ONLY" pavement legend shall be installed across the ramp adjacent to the beginning gore point. The pavement markings will be done in MMA durable material.

- No HOV diamonds are to be used on any of the signs or pavement markings for the 'transit only' ramp areas.

Direct Access Connection Guidelines:

- An "x" mile advance overhead HOV sign and an exit HOV sign should be installed at each HOV direct access ramp.

- A "Restricted Exit/Buses and 2 person carpools only" sign should be installed at the HOV off-ramp entrance. The sign should be placed at the mid-point of the off-ramp taper section in the shoulder area.

- 8 inch white MMA (or thermoplastic) chevrons (with RPM's) should be installed in the HOV gore point areas.

- An HOV diamond symbol shall be installed across the HOV ramp adjacent to the beginning of the gore point. The pavement marking will be installed in MMA durable material.

VVK:vk RB_F_FlyerStop1.doc

DRAFT

Vehicle Odometer Mileage Checking Courses

4-15-2002

General Odometer Course Information:

The Headquarters Traffic Section has been responsible for the installation of vehicle odometer mileage checking courses throughout the state.

The Northwest Region has four mileage checking courses and they are all located on the I-5 corridor. The courses are each five miles long and are located at:

I-5	NB	MP 144.75 vicinity	Federal Way/320th St I/C vicinity
I-5	SB	MP 153.25 vicinity	Southcenter I/C vicinity
I-5	NB	MP 209.75 vicinity	Arlington/Stillaquamish River Br. Vicinity
I-5	SB	MP 224.35 vicinity	SR 534/Conway I/C vicinity

The error between each mileage marker should be less than 25 feet and the accumulative error of the entire course should be less than 25 feet.

NWR – Traffic Operations Supplemental Guidelines:

The NWR Traffic Operations Group will be responsible for maintaining the course layouts.

The NWR Traffic Operations Group will be responsible doing a course recertfication, if the course's signs were revised by a construction contract; or, if the signs were knocked-down or vandalized and replaced by Maintenance.

The mileage signs should be installed by a field survey. However, installation and certification through use of a DMI is also acceptable, if the course layout is triple checked with the same DMI for any inherent/cumulative DMI errors.

NOTE: Based upon a Summer 2001 field review all of the courses will have to be rerun and recertified due to either missing mileage signs or new mileage signs placed beyond the tolerance limits. The courses may be partially relocated due to recent construction activities. This work will be done during the Spring 2002 time frame.

VVK:vk RB_F_Odometer1.doc

WSDOT - NWR Traffic Operations Group

Region Wide Odometer Check Locations

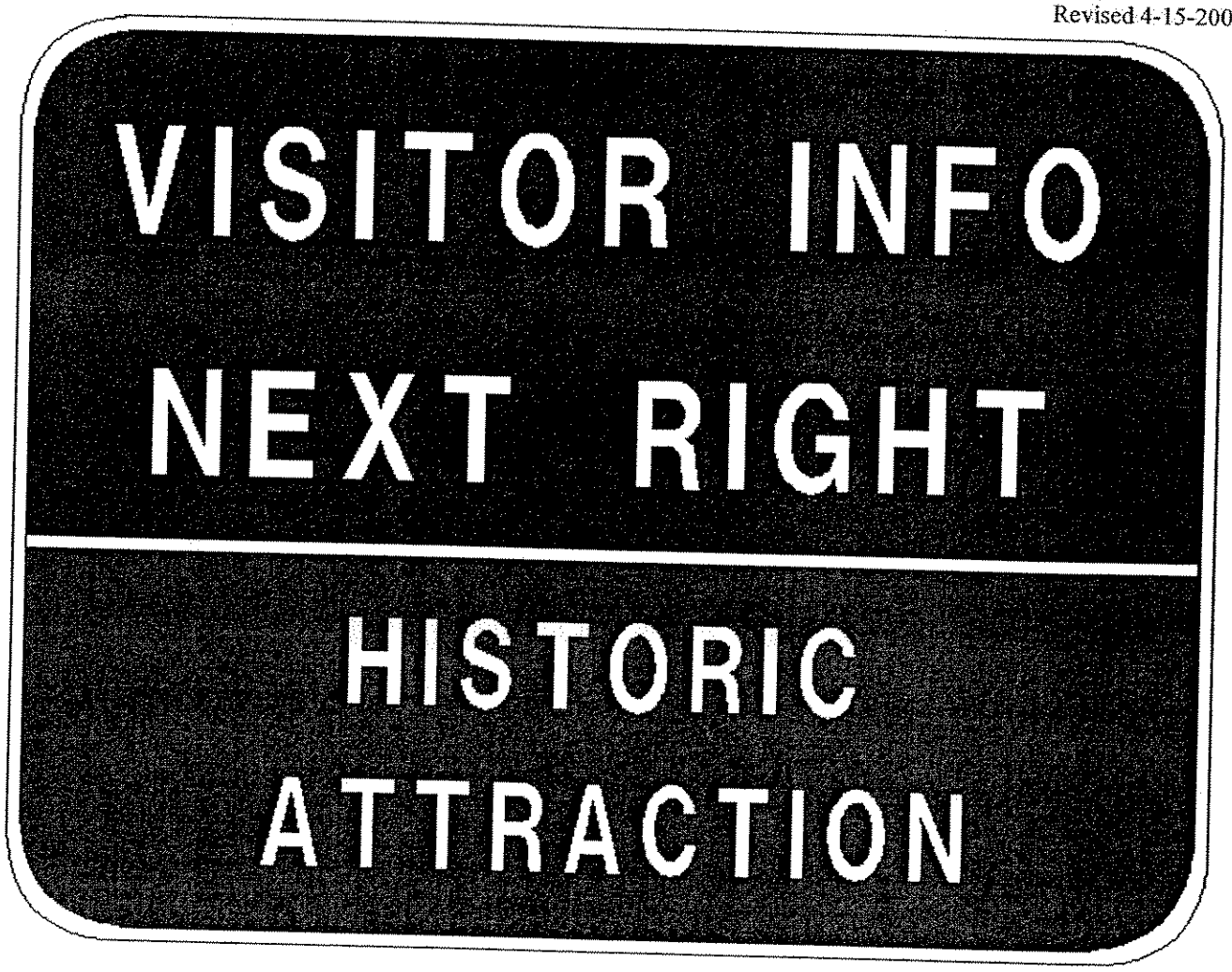
Rev Date: 4-15-2002

Maint. Area	SR	Milepost	Location	Traffic Direction	Sign Message	Sign Status (Missing)
4	5	144.724	Federal Way - S 320th St I/C Vic	NB	SPEEDOMETER CHECK SECTION AHEAD	NO
		145.00		NB	BEGIN CHECK MILE 0	YES
		146.00		NB	MILE 1	YES
		147.00		NB	MILE 2	YES
		148.00		NB	MILE 3	YES
		149.00		NB	MILE 4	YES
		150.00		NB	END CHECK MILE 5	YES
				NB		
Course certification date:				Certified by:		
5	5		Southcenter	SB	END CHECK MILE 5	YES
				SB	MILE 4	YES
				SB	MILE 3	YES
				SB	MILE 2	YES
				SB	MILE 1	YES
				SB	BEGIN CHECK MILE 0	YES
		153.262		SB	ODOMETER CHECK SECTION AHEAD	NO
Course certification date:				Certified by:		
2	5	209.7	Arlington I/C - Stillaquamish R. Br.	NB	ODOMETER CHECK STATION AHEAD	NO
		209.99		NB	BEGIN CHECK MILE 0	NO
		211.00		NB	MILE 1	NO
				NB	MILE 2	YES
				NB	MILE 3	YES
				NB	MILE 4	YES
		214.99		NB	END CHECK MILE 5	NO
Course certification date:				Certified by:		
2	5	219.058	SR 534 I/C - Conway Hill Vicinity	SB	END CHECK MILE 5	NO
		221.044		SB	MILE 3	NO
		222.037		SB	MILE 2	NO
		223.028		SB	MILE 1	NO
		224.023		SB	BEGIN CHECK MILE 0	NO
		224.341		SB	ODOMETER CHECK STATION AHEAD	NO
Course certification date:				Certified by:		

DRAFT

Visitor Information Center (VIC) Signing

Revised 4-15-2002



Forward:

The reader is referred to the Millennium (2000) Edition of the MUTCD and January 2002 Edition of the Headquarters Traffic Manual for the general visitor information guidelines.

NWR – Traffic Operations Supplemental Guidelines:

- Only one visitor information center should be signed at any particular area.
  Example:
  A local chamber of commerce and a United State Forest Service Center (USFS) each want a VIC sign. Both entities are located in the same city or town. We would sign to only one of the facilities. We would work with both entities to determine who would be signed based upon the most information supplied by each center, ease of travel convenience, facilities, etc. We would ask that the signed center provide motorists with information about the second center and how to get to that entity.

- VIC combo board signing will now be allowed, if the second line message meets certain criteria. The second line message can be historical, cultural, museum or recreational attractions, if that item meets the appropriate guidelines and the visitor information center provides information about the attraction either through an on-premise outdoor kiosk or information within the center building.

- Sign spacing -
  Stand-alone VIC signs should meet the nominal sign spacing criteria set for major signs i.e.
  800 feet for freeway facilities
  500 feet for conventional 2-lane, high-speed roadways
  300 feet for multilane and 2-lane, low speed roadways in incorporated areas.

- If there is no room for a stand-alone sign and a plaque sign must be used, do not use the Question Mark sign (D9-1301).

- WSDOT will normally pay for the VIC signing costs. However, if a visitor information center changes locations within a one or two year period, the center may be asked to pay for all of the relocation costs.

  There have been occasions when a center has relocated several times within a one or two year time frame. The Department should not be expected to pick up these additional costs.

VVK:vk RB_F_VIC3.doc

Washington State
Department of Transportation

RECEIVED

FEB 1 9 1998

Traffic Service Engr.

Memorandum

Date: February 12, 1998

From: David K. Peach DKP
Phone: 705-7280

Subject: Supplemental Guide Signs for Cemetery Signs

To: Bob Earnest, Eastern Region
Les Jacobson, NB82/120
Ted Paselk, S-15
Jennene Ring, North Central Region
Toby Rickman, 47440
Bob Baker, South Central Region

Due to circumstances, Northwest Region Traffic Office has been directed to install supplemental guide signs for Tahoma National Cemetery. As a result of these circumstances, we have developed the following draft criteria for the placement of supplemental guide signs for cemeteries.

Cemeteries may be signed from state highways with white on green supplemental guide signs provided sign space is available in accordance with the MUTCD and is in accordance with the following:

- A designated National Cemetery by the United States Department of Veteran Affairs.
- The cemetery must be located within 5 miles of the nearest interchange or intersection.
- Follow-Through signing must be in place before any mainline signing are installed.

In future, we may want to add an annual trip rate for national cemeteries, however, the new Tahoma National Cemetery has been in existence less than six months and has only completed the first phase of three phases. Oregon DOT currently uses 300,000 annual trips, their cemeteries have been fully developed.

Please review the draft criteria and submit comments back to my office by March 20, 1998. If you have any questions, please contact Rick Mowlds at (360) 705-7988.

DKP/RM

cc: Dave McCormick, NB82/120

DOT 700-008EF
Revised 3/93

F-71

Washington State
Department of Transportation

Memorandum

Date: July 14, 1999

From: Toby Rickman
Phone: 705-7280

Subject: Tow-Away Zones on Freeways

To: Dave McCormick, Northwest Region
Jennene Ring, North Central Region
John Nisbet, Olympic Region
Les Rubstello, Southwest Region
Rick Gifford, South Central Region
Ted Trepanier, Eastern Region

The attached March 5, 1999 memo provided the Regional Administrators with the latest listing of the delegated approval authority for traffic regulations. With regard to roadside parking restrictions, which are approved by the regions, I've been asked to provide guidance about the general factors to consider when establishing "instant" tow-away zones on freeways.

This issue is pursuant to RCW 46.55, Towing and Impoundment. Specifically, RCW 46.55.010(12)(a)(i), together with RCW 46.55.113, provides that vehicles left unattended at public locations may be immediately removed if constituting an accident or a traffic hazard. Unfortunately, there have been several instances where the WSP has been forced to pay towing and impound fees for vehicles removed under this statute, where the necessity for removal was disagreed with judicially.. Thus, in the interest of safety instant tow-away zones are the logical recourse available until such time as the law may be changed.

When you consider establishing tow-away zones for this purpose, please be sure to examine the following as part of your analysis:

- shoulder width, curvature, sight obstructions
- areas of regularly occurring congestion requiring the use of shoulders by emergency responders
- continuity of zones, e.g., in areas near the junctions of major highways the traffic regulation may need to consider more than one route
- areas having a history of crashes with shoulder parked vehicles
- WSP and other emergency responder's observations and concurrence

Don't hesitate to call Lloyd or me a call if you have any questions.

TR:le
Attachment

cc: Commander LaMunyon, WSP, 42600
John Conrad, 47350

Washington State
Department of Transportation

Memorandum

Date: January 14, 2000

From: Toby Rickman
Phone: 705-7280

Subject: Type 1a Signs

To: Les Rubstello

Attached are recently developed criteria to assist with assessing Type 1a Directional or Official Signs, as defined in the Scenic Vistas Act and Part 750 of the Code of Federal Regulations.

The criteria have been reviewed and concurred with by the Federal Highway Administration and the Attorney General's Office. Ultimately the criteria will be incorporated into the Traffic Manual, however in the meantime we'll provide a copy to the other regions to assure regulatory consistency statewide.

Please give Lloyd Ensley a call if you have any questions.

TR:le

cc: Dave Leighow, FHWA, 40943
Talis Abolins, AAG, 40113
Venita Aldrich, S-15
Willie Harris, S-15

Directional and Official Sign Criteria

for off-highway signs

1/13/00

Directional Signs

May Contain Directional Information About

Public places owned or operated by Federal, state, or local governments or their agencies

Publicly or privately owned

- natural phenomena
- historic, cultural, scientific, educational, and religious sites
- areas of natural scenic beauty or naturally suited for outdoor recreation

Privately owned

- scenic attractions
- must be nationally or regionally known and of outstanding interest to travelers

Directional Sign Standards

- 150 sq. ft., and 20 ft. height and length maximums
- location must be approved by the department
- no nearer than 2,000 ft. from an interchange along the interstate system or other freeways measured from the ramp physical gore, or 2,000 ft. from a rest area, park land, or scenic area
- no 2 directional signs facing the same direction of travel may be less than 1 mile apart
- no more than 3 directional signs pertaining to the same activity and facing the same direction of travel may be erected along a single route approaching the activity
- signs located adjacent to the Interstate system shall be within 75 air miles of the activity
- signs located adjacent to the non-Interstate National Highway System shall be within 50 air miles of the activity

Message Content Limitations

- identification of the attraction or activity
- directional information useful to travelers in locating the attraction such as mileage, route numbers, or exit numbers
- descriptive words or phrases, and pictorial or photographic representations of the activity or its environs are prohibited.

Official Signs

Official Signs Are:

erected and maintained by public officers or public agencies

within their territorial or zoning jurisdiction

pursuant to and in accordance with direction or authorization contained in Federal, state, or local law for the purpose of carrying out an official duty or responsibility

Official Sign Standards

150 sq. ft., and 20 ft. height and length maximums

sign must be erected and maintained by a public officer or agency

the officer or agency must exercise some form of governmental authority over the area upon which the sign is located - governmental authority means the authority to enact or administer the law

the officer or agency must be directed by statute or local law and/or must have the specific authority by statute or local law to erect and maintain signs

the agency must have a vested interest in a destination described on an official sign

there are no restrictions on the message content so long as the activity being described is in furtherance of an official duty or responsibility

DRAFT

Parking Guidelines

(Headquarters Design and Traffic Section Information)

Revised 4-15-2002

Headquarters Supplemental Information:

Both the Headquarters Design and Traffic Sections have provided information on various parking inquiries. All of the information received was by e-mail. The data has been condensed and reformatted in order to fit within the RedBook format.

The following information was provided by Larry Hinson and Dick Albin (Headquarters Design Office) and the Headquarters Traffic Section staff:

Angle Parking:

- Angle parking is not allowed on state highways (RCW 46.61.575).
- Angle parking may be allowed on state highways within incorporated areas on a case-by-case basis. The State Traffic Engineer would have to approve any such action.

  A local agency would have to approve the angle parking by either an ordinance or resolution and send a justification request (including the approval documentation) to the NWR Traffic Engineer for further processing. The NWR Traffic Operations Group would review the request for the NWR Traffic Engineer and determine if the angle parking was within the guidelines permitted by AASHTO. The request would then be sent to the State Traffic Engineer for his approval via an "Angle Parking" calendar action (Traffic Regulation Approval).

General Parking Restriction Information:

Parking restriction signing is not normally necessary for items covered by "Rules of The Road" traffic regulations. Installation of such signing may be counterproductive in that motorists may assume that if there is no parking restriction signing, it is ok to park at a particular location. In cases where a local agency or the Department may want to extend/expand a parking restriction beyond the limits covered by the regulations then signing becomes appropriate.

A "Parking Restriction" calendar action is required for any parking restriction not covered by RCW 46.61.570. The NWR Traffic Engineer is the approving authority for the Northwest Region, exclusive of an angle parking restriction.

In incorporated areas the local agency would have to approve the parking restriction by either an ordinance or resolution and send a justification request (including the approval documentation) to the NWR Traffic Engineer for further processing. The NWR Traffic Operations Group would review the request for the NWR Traffic Engineer and determine if the parking restriction is acceptable per current guidelines.

Parking restrictions contained in RCW 46.61.570 are noted below.

Parking is prohibited when:

- On a sidewalk or street planting strip
- Within five feet of a public or private driveway
- Within an intersection
- Within 15 feet of a fire hydrant
- Within 20 feet of a crosswalk at an intersection
- In a crosswalk
- Within 30 feet of any flashing light, stop sign or traffic control signal
- Between a safety zone (an area of the roadway set apart for the exclusive use of pedestrians) and the curb, or within 30 feet of either end of the safety zone, unless a different distance is indicated by signs and markings
- Within 50 feet of the nearest rail of a railroad crossing
- Within 20 feet of any fire station, or within 75 feet of the entrance if you are on the opposite side of the street
- Beside any street excavation or obstruction where stopping, standing, or parking would obstruct traffic
- On the roadway side of any vehicle stopped at the edge or curb of a road (double parking)
- On any bridge or elevated structure
- In a highway tunnel
- In a place marked "reserved for the handicapped", unless your vehicle has a special license, decal, or card issued to a disabled motorist
- Any other place where official signs prohibit stopping

If the restricted area has a curb section, painting the curb "red" is another acceptable method of denoting the restricted area. The color "yellow" should not be used to denote a restricted area, unless there are corresponding signs to inform a motorist what the color designation means. Curb painting outside the limits described above must be accompanied by corresponding parking restriction signing.

VVK:vk Parking1.doc