Introduction

We performed a peer review of traffic control devices at selected locations on the City’s street system. As the result of our review, we have suggestions for possible revisions to traffic control devices at some of the locations.

Legal Aspects of Budget Constraints

Cities and counties typically fund their desired street improvements, transportation activities, and maintenance. It is up to the City Council/County Commission to decide where available resources should be used. When available resources are insufficient to fund all desired improvements, equipment, and maintenance, funds must be allocated based on safety and importance. In doing this the City Council/County Commission must use their discretion. This provides the decision-making body the opportunity to employ discretionary immunity in their planning and allocation of funds to control their liability for tort claims arising from crashes.

A page in the Appendix on “Discretionary Immunity” discusses the discretionary immunity concept, and how it may be used in the operations and planning process for transportation activities to reduce liability for local jurisdictions.

Hazel Ave at Churchill Ave

The four-leg intersection of Hazel and Churchill is in a hilly area. There are STOP signs for northbound and southbound traffic on Churchill at the intersection. There is a steep downgrade for westbound traffic on Hazel to the east and west of the Churchill intersection, but the grade flattens through the intersection. This creates an abrupt crest vertical curve on Hazel at the east edge of the Churchill intersection, which tempts some drivers to travel at excessive speeds to experience a floating sensation. To prevent unsafe speeds, the City installs a barricade at the east edge of the intersection that closes the east intersection leg in the spring. The barricade is removed during the winter due to concerns that eastbound traffic on Hazel might not be able to stop before colliding with the barrier during icy roadway conditions.

City staff reports that there are some neighborhood residents who are in favor of the barrier and some who are not. The City wishes to resolve the issue in a manner that reduces or eliminates the cost of installing and removing the barrier every year.
We observed that there might be some sight distance restrictions for drivers stopped at the STOP signs on Churchill although we did not attempt to make any measurements.

After reviewing the location, we developed several alternative improvements that could alleviate the situation:

1. Reverse the STOP signs so that eastbound and westbound traffic on Hazel is required to stop. Although this would require traffic on the higher-volume street to stop, the intersection volumes are not high and would not result in excessive delays or queues. The disadvantage is that downhill traffic on Hazel might slide through the intersection when the pavement is icy, although this is not an unusual situation in this area.

2. Convert the section of Hazel between Churchill and Evergreen to one-way traffic westbound. This could be accomplished by constructing a partial street diverter at the east edge of the intersection. The diverter should be designed with a mountable curb in case it is struck by an eastbound vehicle on Hazel when the pavement is icy.

3. Install an all-way STOP at the intersection. Although we would not normally suggest an all-way STOP for a low-volume intersection such as this, we think it would be justified at this location due to the importance of deterring high speeds over the vertical curve crest.

Of these alternatives, we think that an all-way STOP might provide the best combination of effectiveness and low cost.
We noted during our site observations that the back sides of the barricades (facing westbound uphill traffic) are not reflectorized. We understand that the present barricades are temporary, but if new barricades are constructed to be used on a regular basis, both sides should be reflectorized.

We also noted TRAFFIC CONTROL CHANGE AHEAD advance warning signs on Hazel. Because the barricades involve a road closure, the use of STREET CLOSED AHEAD signs might be more appropriate.

**Monroe Rd and Western Blvd**

Western at its intersection with Monroe has one through lane in each direction. The south leg has striped bike lanes on each side and a striped centerline. The north leg has no striping, although there are some temporary centerline dots that extend about 100 ft to the north of the intersection. The north and south legs are each controlled by a separate traffic signal phase.

City staff reports, and we observed, that northbound drivers on Western sometimes form two lines. The right line typically turns right, although some drivers in the right line proceed through the intersection. Drivers in the left line proceed through or turn left. The formation of two lines might be encouraged by the faded condition of the bike lane line. We noted that drivers on the north approach also tend to form two lines, with vehicles in the right line turning right.

As an interim intersection improvement, we suggest that the northbound bike lane line on the south leg be restriped, and that a bike lane symbol and arrow be installed a short distance south of the crosswalk. We also suggest that the northbound bike lane be extended approximately 200 ft to the north of the intersection to emphasize the presence of the bike lane. A double yellow centerline could be striped for about 200 ft north of the intersection.

We think that there might be some benefit to eliminating the split phasing on the north and south intersection legs. A preliminary capacity analysis indicates that permissive phasing on the north and south legs might reduce delay. We suggest that the City conduct a detailed capacity analysis of the intersection to determine whether the split phasing should be eliminated with the existing lane configuration.

The ultimate solution to the intersection delay is to restripe Western to include a left-turn lane on both the north and south approaches and eliminate the split signal phasing. This could be done with traffic lanes 11 ft wide and bike lanes four to five ft wide. Increasing the small curb radius in the southwest corner of the intersection would be required to permit school buses and trucks to make the right turn from eastbound to southbound without encroaching on the northbound left-turn lane. Relocating the existing wood traffic signal pole and constructing a new curb along the edge of the existing sidewalk would probably provide an adequate curb radius.
Looking south on Western at Monroe.

Southwest corner of Western and Monroe.
**Graves Rd**

The section of Graves Road between a scenic river and Tyler Road has several curves but does not have Curve warning signs. As requested, we reviewed options for installing Curve signs.

For eastbound traffic there is a curve to the right at Broad St. We suggest that this curve be signed in each direction with a Curve or Turn sign, as appropriate, and with a speed advisory plaque based on ball bank indicator readings. About 300 ft east of Broad there is a slight curve to the right, but based on the 30 mph speed zone on Graves, curve signing is probably not needed.

Near the scenic river trail there is a curve to the left, followed shortly by a curve to the right at Wyoming Road. This pair of curves could be signed in each direction with a Reverse Turn sign with an advisory speed plaque showing the advisory speed for the slower of the two curves. But if the difference in advisory speeds for the two curves exceeds 5 mph, we suggest that the two curves be signed separately. We do not think that either curve is long enough to warrant the use of a Hairpin Curve sign.

If warranted by the crash histories on the curves, Chevron signs could be also installed as needed on the outsides of the curves.

**Riley Ave and Easton St**

Riley approaches Easton from the west to form a T-shaped intersection. Traffic on Riley is controlled by a STOP sign.

There is one through lane in each direction on Riley, but on the approach to Easton the centerline striping is offset to the north to permit the striping of separate lanes for left turns and right turns. There is a striped bike lane on each side of Riley, but to accommodate the turn lanes, the eastbound bike lane line stops about 170 ft west of the intersection. There is no guidance for eastbound bikes on the intersection approach.

Riley is 40 ft in width. This is not sufficient to accommodate three traffic lanes plus two bike lanes.

We suggest that consideration be given to installing an eastbound bike lane about five ft in width between the left-turn lane and the right-turn lane. To obtain the necessary width for this bike lane, the westbound bike lane could be eliminated for a distance of about 150 ft from the intersection. This would permit an 11-ft right-turn, an 11-ft left-turn lane, and a 13-ft westbound lane, leaving 5 ft for the bike lane. The eastbound curbside bike lane should be connected to the bike lane segment between the turn lanes by dotted white striping similar to that shown in Figure 9C-4 in the MUTCD.
Although the turning radius for eastbound right turns is small, large vehicles could, if necessary, encroach onto the bike lane to make the right turn. Elimination of the westbound bike lane for about 150 ft is probably not critical, because all westbound traffic will have turned off of Easton and will be entering Riley at relatively low speeds.

We observed that west of the intersection, the bike lanes are about 4.5 ft in width and each of the two traffic lanes is about 15 ft in width. It might be possible to increase the bike lane widths by reducing the widths of the traffic lanes.

*Looking east on Riley toward Easton.*

**Signs Obstructed by Vegetation**

We observed a few instances of traffic control signs obscured by tree branches. We recognize that this can be a difficult situation in an urban area. Tree branches often extend into the public right-of-way, and it can be difficult to trim the trees adequately without destroying the beauty of the trees.

We suggest that sign visibility be checked as part of the City’s periodic sign inspection program, and that the visibility of obscured signs be improved where possible. Following are some examples of signs with visibility restricted by vegetation.
Obscured STOP sign northbound on 1st Street at Blaine Avenue.

School speed limit sign blocked by tree branches, westbound on Hughes near 9th.
Obscured School Crossing sign westbound on Hughes at Cambridge.

Looking east on Evergreen toward Harlem.
**School Zone Signing**

School zone signing as used in Oregon is complicated. In addition to the requirements of the MUTCD, there are ODOT requirements for school signing that are based on Oregon state law. Chapter 7 of the ODOT Sign Policy illustrates school zone signing for several different situations, and is on the internet at:


Where there is a 20 mph school speed limit, the ODOT drawings indicate that the END SCHOOL SPEED LIMIT sign is to be used at the end of the school speed zone. If FINES HIGHER signs are used, then an END SCHOOL ZONE sign is to be used at the end of the school speed zone. We did not observe any school zones with FINES HIGHER signs. The use of a SPEED XX sign at the end of the school zone is optional. If it is used, it may be installed either beyond the END SCHOOL SPEED LIMIT sign or on the same post as the END SCHOOL SPEED LIMIT sign.

The ODOT policy for marking the end of the school speed limit is consistent with the MUTCD. The MUTCD states (Section 7B.15) that the downstream end of a school speed limit must be marked with an END SCHOOL SPEED LIMIT sign, except that where FINES HIGHER signs are used, the END SCHOOL ZONE sign may be used. The reason for allowing use of the END SCHOOL ZONE sign with higher fines is that the laws of some states (including Oregon) relating to higher fines refer to a school zone rather than a school speed limit.

The City uses END SCHOOL ZONE signs even though there are no FINES HIGHER signs, which is inconsistent with the MUTCD. However, it is not apparent to us that there are any significant negative impacts associated with the use of this sign. The City may wish to review this issue and determine whether or not to revise its current school signing policy.
Looking west on Northern Ave showing typical use of an END SCHOOL ZONE sign.

We noted that the school zone on Central Dr at Seton does not have signing indicating the end of the school speed zone in either direction.

**Back-to-Back Signs**

At the intersection of Danbury and Haller, northbound traffic on Danbury is controlled by STOP signs. There is a DO NOT ENTER sign mounted on the back side of each of the two STOP signs.

The MUTCD states that a sign that is mounted back-to-back with a STOP or YIELD sign should stay within the edges of the STOP or YIELD sign. This could be accomplished by installing the DO NOT ENTER signs on separate sign posts or by increasing the size of the STOP signs.

Looking south at the intersection of Danbury and Haller.
**All-Way Stops**

There are several all-way STOP intersections that have 4 WAY plaques below the STOP signs. The current version of the MUTCD requires that an ALL WAY plaque be used. When existing 4 WAY plaques are replaced as part of routine maintenance, they should be replaced with ALL WAY plaques.

At the intersection of Harlem and Evergreen there is a supplemental STOP sign on a mast arm. The MUTCD requires that an ALL WAY plaque be mounted below each STOP sign at all-way Stops. If the supplemental STOP sign is replaced for maintenance reasons, the City should consider mounting a plaque below the STOP sign.

*Looking east on Evergreen at Harlem.*

**Lane Lines**
We noted some locations on Evergreen Ave where the lane line striping could be improved.

Eastbound on Evergreen between 3rd and Harlem, the right lane becomes a mandatory right-turn lane at Harlem. For this type of situation, in addition to the wide solid lane line, the MUTCD requires a wide dotted lane line (see Figure 3B-11 in the MUTCD). We also noted that the lane-use control sign at this location has extensive cracking on its face and might not have sufficiently reflectivity.

Looking east on Evergreen toward Harlem.
Looking east on Evergreen toward Harlem.

Eastbound on Evergreen approaching 3rd, and westbound on Evergreen approaching Division, the lane line is a wide solid line. Unless the City has a reason for the wide solid lines, they should be restriped as normal broken lines to avoid misleading drivers into thinking that there is a mandatory right-turn lane.

**Bike Lane Striping**

We noted that, in general, the bike lane striping is consistent with MUTCD standards.

The striped westbound bike lane on Evergreen approaching Harlem ends abruptly. Although the existing striping is not inconsistent with the MUTCD, the City might want to consider using a dotted line for the last 50 ft or so of the bike lane to warn bicyclists that the bike lane is ending and that they must merge with motorized traffic. Also, there is a sign that some jurisdictions in Oregon are using to indicate the end of a bike lane which the City might want to consider.
Looking west on Evergreen toward Harlem.

Bike Lane Ends sign.

Street Name Signs

With the new 2009 edition of the MUTCD, the standard lettering for street name signs was changed. The new MUTCD states that for local roads with speed limits of 25 mph or less, the lettering height should be composed of initial upper-case letters at
least 4 inches in height and lower-case letters at least 3 inches in height. For streets
with higher speed limits, the upper case should be 6 inches and the lower case 4.5
inches. The change in lettering style was made because studies found that the new
style was more readable than lettering that is all upper case. The change in size
requirements for speed limits higher than 25 mph was made in recognition of larger
numbers of older drivers.

It is not necessary to replace any existing street name signs to meet the new
standards, but all new or replacement signs should meet the new requirements. We
understand that the City is aware of this change and is in the process of revising its
signing practices accordingly.

An example of the new street name sign standards. Sign borders are optional.
APPENDIX
DISCRETIONARY IMMUNITY

Are Your Policy Makers and City Counsel Using it Effectively in the Planning Process?

This appendix is based on discussions on risk management relative to highway safety liability. The general concept behind “discretionary immunity” is that the governing body of a jurisdiction must decide the effective and equitable use of their resources to perform all the necessary activities for which they are responsible, be they social, safety, financial, educational, etc. They plan with aid of legal counsel to order, restrict, or exclude activities from their budget and program to achieve jurisdictional objectives.

It may be that city councilors could legally, with the aid of counsel, set a policy to reduce the city’s liability for serious safety hazards under “discretionary immunity” where resources are limited.

A county road department may be directed by the County Commission to leave some roads unplowed in the winter, or may be given a list of the priorities on which roads should be plowed and when, recognizing the resources available. The county road department should use its data and expertise to inform and guide the county commissioners to the most cost-effective and equitable program. However, if the final decision and plan resolution are enacted by the county commissioners with guidance from legal counsel, “discretionary immunity” might be claimed.

Another example where “discretionary immunity” might be employed is where there are numerous low volume unsignalized intersections that do not justify the expense of signing. The county commissioners, together with legal counsel, may consider a policy that certain intersections will not be controlled, even though intersection sight distance may be restricted at some times of the year by crops or snow. STOP signs placed at very low volume intersections are frequently violated, and their use is not cost effective at such sites. Consequently, the use of STOP signs at these sites may not be in the public’s best interest.

Note: For more information on this concept contact Dave Kramer, Attorney-in-Charge, Trial Division, Oregon Department of Justice.
SCHOOL SIGNING
Condition "A" with School Crosswalk
• Adjacent to School Grounds

* SCHOOL/FINES HIGHER sign assemblies may be used in Condition "A" school zones only with SCHOOL/SPEED LIMIT 20 WHEN FLASHING sign assemblies.

(SPEED MAX 20) or (SPEED LIMIT XX) *****

*** Use of a rear-facing flasher is optional for situations where side road traffic enters from within the designated school zone. See Std. Detail DET 4410 for more information on rear-facing flasher units.

(SPEED LIMIT)

**** Use END SCHOOL ZONE sign for zones that include FINES HIGHER signing. The END SCHOOL SPEED LIMIT sign is to be used otherwise.

****** SPEED XX or SPEED LIMIT XX sign may instead be installed at the same location as, and on the same support with, the END SCHOOL SPEED LIMIT sign.

(SCHOOL/SPEED LIMIT MAX 20) or (SCHOOL/SPEED LIMIT XX)

**** Locate the SCHOOL/SPEED LIMIT 20 sign assembly at the beginning of the school speed zone, which is typically 200 feet min. from the school grounds or the school crosswalk, or as established by an engineering study.

OREGON DEPARTMENT OF TRANSPORTATION

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