February 29, 2016

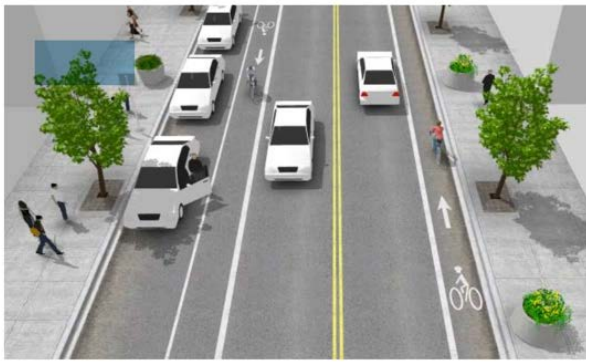
The following is a summary of the SBAB Working Group's comments on the DRAFT Right-of-Way Improvement Manual. Specific comments can be found in the attached pdf, which has been reduced to the pages which this group focused on, specifically.

GENERAL Comments

There appears to be missing guidance and references to standard plans and/or definitions for the following: Vaned drain grates, Sharrows, Detector sensitivity, and NACTO-compliant guidelines regarding construction of paving joints adjacent bike lanes. Some of these items existed in the old ROWIM and should be restored.

- **Endorsed design standards:** Four major manuals are cited (AASHTO; MUTCD; NACTO; and FHWA). The ROWIM should state how and to what extent the ROWIM standards and bike facility design criteria are based on each of these. At a minimum we would like to see that the ROWIM is written to meet or exceed NACTO standards.
- **Graphic clarity:** The ROWIM should rely more on clarifying graphics to illustrate standard practice, rather than text descriptions. Consider using diagrams from available national standards such as NACTO, FHWA or NHWA, instead of custom graphics. For example, the NACTO Guide features one- and two-page graphic spreads, as well as photographs from bike facilities in cities in the US and around the world.

  Specifically, when illustrating bike lane designs that will be paved with standard asphalt pavement, do not use a different shade from the rest of the roadway pavement. It implies greater visual differentiation from other lanes than will actually be the case. Unless colored or painted pavement is a recommended feature of the bike lane, use the same shade of gray as for other travel lanes



- **Consistent terminology:** Terms such as "bollards," "flexible delineators,"" flexible delineator posts,"and "rigid barriers," should be well-defined and differentiated from one another – and used consistently throughout the ROWIM.

- Construction Zone Access (p.207-210): These are temporary measures, not right-of-way improvements. This section should be deleted from the Right of Way Improvement Manual to avoid confusion and conflicts for applicants, and to make it easier to keep the Director's Rules in sync. The ROWIM should simply include a link to the Traffic Control Manual.

pp. 203-261 BIKE FACILITY DESIGN STANDARDS

One Way vs. Two Way Protected Bike Lanes: The ROWIM states that one way PBLs are preferred over two way PBLs but most of these facilities in Seattle are currently two-way designs. Clarify when the exception to the preferred configuration is acceptable, and maintain consistency with NACTO Design guidance.

PBL lane configurations: Provide NACTO guidance on left-sided PBLs – in particular, when they might be used in lieu of right-sided PBLs. Design mitigation measures should include, at a minimum: protected left turns with arrows at intersections; placement of bike signals/arrows above each lane, rather than all on the left side of the intersection; "NO TURN ON RED" signage next to the left turn arrow; and potentially other signage or advance signalization (as flashing lights) to indicate no left turns on a red arrow and increase driver compliance with no left turns on red.

Buffer Zones: This states that "street buffer zones may be narrowed to a minimum of 2 feet in constrained conditions; 3 feet where the buffer is adjacent to parking." Clarify or illustrate what constitutes a constrained condition that would make this reduction acceptable – such as locations adjacent an ADA parking stall access aisle.

Physical Separation Elements: Provide clear guidance on when to install different types of separation, particularly flexible delineators versus more protective elements as planters, raised curbs, concrete barriers or parking lanes (or a combinations of these). Selection of vertical barrier materials should be based on traffic volume, corridor speed limits, and predominant modes of transportation. In other words, flexible delineator posts would not be appropriate in a 35 mph zone or along a freight corridor.

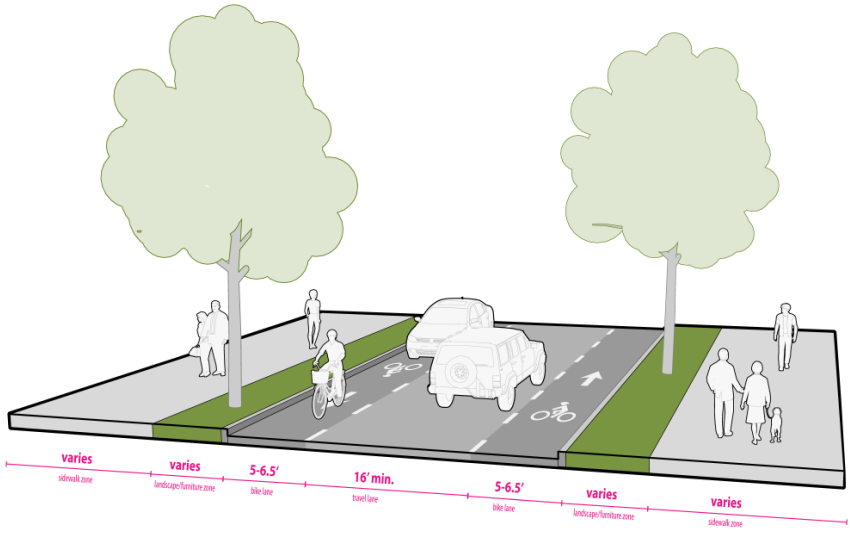
Bike Lane and Buffer Widths: Design to meet or exceed NACTO standards. For instance, we prefer to see PBLs designed to the desirable NACTO standard of 12 feet for two-way PBLs rather than the minimum of 10 feet. NACTO also advises that bike lane widths be 5 feet, but where feasible and desirable due to uphill or high bicycle volumes, constructed to the higher standard of 7 feet.

Protected Intersection Design: This is a best practice intersection treatment, and should be elevated in preference over other treatments. It protects both pedestrians and bicyclists, and allows for easy bike turning movements. The addition of shark teeth, raised crosswalks, or signage for bicyclists to slow and yield to pedestrians may be useful. Also, a version of this showing a one-way PBL would be helpful – perhaps to demonstrate how larger truck turning radii could be accommodated. Graphics on pp. 219-220 and 246 best illustrate this design approach.

Contra-Flow Bike Lanes: The contra-flow design may introduce additional conflict points for motorists not expecting oncoming bicyclists. Carefully define (per NACTO) where protected contra-flow lanes may be appropriate for design, such as on higher volume/speed streets where alternate streets do not provide safe and direct routing.

Include guidance from NACTO for use of “No right turn on red” restriction at cross streets, double yellow lines or curb separation from travel lanes, and option to use colored pavement at intersections and driveway exits.

Advisory Bike Lanes (graphic below):



Advisory Bike Lanes are not recommended – Sharrows should be used where there is insufficient ROW space for a buffered or protected bike lane. This typology (while listed in the Bicycle Master Plan) does not convey sufficient caution to drivers and instead encourages them to borrow space from people in separately marked bike lanes. Preference should be given to designs that encourage the opposite behavior of *drivers yielding to bikes*.

Intersection Treatments

- Require green markings within mixing zones and across intersections to improve visibility of bike lanes – especially for conventional (unprotected) bike lanes.
- Give preference to bike boxes or forward stop bars in order to provide flexibility for bikes to go straight or turn, while maximizing their visibility at controlled intersections. The graphics provided should support this preference.
- Clarify that a bike lane may be positioned to the right of a right turn only lane if split-phase signal timing is used (NACTO).

Shared Turn Lanes

- Where there is insufficient ROW space for a dedicated bike lane, mark the shared turn lane with sharrows. Subtle variations in markings only confuse users (both bicyclists and drivers).

- Sharrows, green markings, and bike boxes are all appropriate design tools for maximizing bicyclist visibility and should be used in combination where bikes and vehicles share a turn lane (NACTO).

- Consider need for longer mixing zone and longer setback of mixing zone from intersection on Major Truck Streets and bus routes with articulated buses.

Bicycle Signalization

- NACTO Design Guidance for "bicycle signal heads" (pp. 99-116) needs to be referenced in the ROWIM. Please ensure these revisions are made.

- Regarding Rectangular Rapid Flash Beacons (RRFBs): Additional passive activation should be considered for locations with high volumes of bicycle traffic, and at locations that do not allow easy access by bicycle riders to push buttons at the curb.

Neighborhood Greenways – Intersection Controls

Add provision for stop signs at uncontrolled intersections on Greenway route, at non-arterial streets and on arterials with low volume traffic.

Arterial Traffic Calming

The ROWIM states that pedestrian and bicycle movements should be given *equal* consideration with vehicle movement in the design and implementation of arterial traffic calming projects. We would advise that the needs of vulnerable users such as pedestrians and bicyclists should be given *higher* priority.

Adaptive Design Strategies: Adaptive Protected Bike Lanes

The ROWIM states that in these temporary PBLs "vertical separation can be achieved with flexible bollards, *rubber curbs, parking stops*, planter boxes, concrete/stone barriers, or parked cars." Rubber curbs and parking stops are not sufficient vertical protection for permanent PBLs--nor should they be used for temporary or pilot PBLs.

On-Street Bicycle Parking Standards

Reference to Land Use Code: Note that there needs to be coordination between SDOT and DPD with regard to clarifying bike parking within the Land Use Code. The way the code reads currently, developments may provide both short- and long-term bike parking within the garage of a new building. This means there is no minimum quantity (or maximum distance to) bike racks along an improved or modified ROW.

Reference to the APBP bicycle parking guide is offered as a link in the ROWIM. While these guidelines are good for reference, they are not necessarily relevant to typical sidewalk widths and parking standards in the city of Seattle. The ROWIM should instead provide diagrams in the clearances section (4.21.2) for typical layout that provides similar information, but with flexibility for design: such as minimum clearances for individual bike rack layout (i.e. 6' lengthwise, 30"-36" lateral separation, 48" clear walking space between bike racks and other street furnishings/vertical elements), with configurations that are both perpendicular and parallel to curb.

Bicycle Parking Clearances

In addition to clearances listed in the table, provide graphic guidance. For instance: if a u-rack is placed perpendicular to the curb, it needs to be far enough back to prevent the bike from overlapping with the curb. A clearance distance for the rack itself is insufficient.

Provide a link to the standard Sight Distance Triangle plan for bicycle parking offsets from driveways and garage entries.

Shared Use Paths

This section needs more detailed intent, standards and design guidance, and should be cross referenced in the Bicycle Facility design section.

Shared use paths are critical and well-used elements of the bicycle and pedestrian network. Long portions of the Burke-Gilman Trail, the Alki Trail, West Duwamish Trail and West Seattle Bridge Trail are Shared Use Paths with high volumes of pedestrian, bicycle and other non-motorized wheeled travel.

- Add language that allows for Shared Use Paths to connect segments of Neighborhood Greenway routes that are interrupted by arterial streets or steep slopes; to connect to off-street paths and trails; and to connect to Protected Bike Lanes at locations that do not have sufficient ROW width for protected bike lanes.

- Maximum recommended grade: 5 percent. Where necessary due to topography to exceed 5 percent, the minimum width shall be increased to allow for passing and weaving.

- Centerline striping should be used on Shared Use Paths as standard practice, to encourage all users to stay to the right for safety, except when passing. The presence of centerline striping helps both reduce conflicting pedestrian and wheeled user movements as well as alerting all users that attention *is* needed."

Driveway Design

- Provide a link to the standard 10'x10' Sight Distance Triangle plan for bicycle parking offsets from driveways and garage entries.

- Consider adding to Standard Plans or to these Design Considerations a requirement to add a stop bar and stop sign on the property side of the driveway in advance of a sidewalk or multi-use path that is likely to have bicycle or other wheeled use or high volume of pedestrian traffic.

- Provide guidance for signage and warning devices around garage driveways (i.e. enhanced auditory or visual warning devices such as flashing lights or beacons.