NACTO's *URBAN STREET DESIGN GUIDE*: READY FOR PRIME-TIME? *Observations and Comments*

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The *Urban Street Design Guide* (USDG), published late in 2013, is an important contribution to the 'toolkit' available to planners and engineers working in the urban street environment. The USDG is attractively designed with graphics and photos. It brings together in one place many ideas for creatively reconfiguring and reusing urban streets. It catalogs many techniques that had previously been scattered among different publications, including ones found in ITE *Handbooks,* informational reports and recommended practices. Despite this, I argue in this paper that the *Guide* is in need of a second, updated edition, because it:

- Fails to note that many proposed techniques are not legally permissible in some or most jurisdictions, including recommendations that are inconsistent with the Manual on Uniform Traffic Control Devices (MUTCD)
- Contains internal inconsistencies
- Doesn't acknowledge the trade-offs inherent in many of the actions it recommends; evaluating, explaining, and making such choices are central to the transportation professional's job
- Is selective in terms of the facts presented, and in a few cases is factually inaccurate
- Neglects some available traffic control tools, such as modern roundabouts and improved signal timing
- Largely ignores maintenance, operational, and liability issues

I discuss each of these below. Perhaps the biggest concern is that, despite its 181 pages, the USDG tends to oversimplify many choices. This begins on page 5, where the burden of reducing traffic fatalities is put squarely on the shoulders of traffic engineers, ignoring the role of enforcement, driver education, the judicial system, pedestrians, and other street users (all page numbers cited refer to the first hardcover edition noted above).

- Some tools suggested are not legally permissible in some jurisdictions, and some of its recommendations are not MUTCD compliant or require changes in federal law

Given its force of law, most of us apply the MUTCD, or our state's version of it. Contrary to the MUTCD, the USDG shows SHARED STREET signs (in various places, including pages 24 and 26). An orange SHARED STREET AHEAD sign is shown (page 27) where a yellow warning sign should be used. Blue/green pavement is shown (page 35) for transit-only lanes, whereas the MUTCD's (experimental) color is red. On Page 97, bullet 5, we are told that "Long, unsignalized corridors

may require installation of all-way stop signs" for speed control, whereas the MUTCD states that STOP signs should not be used for that purpose.[1]

The USDG recommends considering freight delivery restrictions, but delivery restrictions have proven highly unpopular with truckers and sometimes businesses (page 11, item 5). Attempts to restrict truck activity generated tremendous controversy in Los Angeles, among other cities, and largely ended in failure.

- Internal inconsistencies

There are several worth mentioning: the curbless street treatments suggested (page 29 illustration) could actually promote parking/driving in the pedestrian traveled way. Banning left or right turns (page 95), although desirable in some circumstances, has the potential for creating some of the same issues as encountered with one-way streets, namely, a driver may have to make additional turns to get to her destination (e.g., a no left turn restriction might result in three right turns in order to reach a destination). On page 129 (noted as 'phase 3'), pedestrians appear to be crossing the street in conflict with an exclusive "dedicated" left-turn phase. Pages 53 and 55 have contradictory statements about W17-1 signs, which both in turn vary from the actual text in the MUTCD. Page 119 shows a truck turning right around a corner with a small curb radius, but closer inspection of the photo shows the trucks rear wheels riding over the curb—with associated potential damage to the curb, or worse, to pedestrians standing on the corner.

Page 115 says that "Shared streets should have limited or no markings to reinforce the regulation of the street as a share spaced," contradicting many of the illustrations. Most of all, the use of the word 'shall' in various places in the document is troubling, since the USDG is not an official standard, and in fact, its title (Design Guide) suggests that it is in the realm of recommendations and suggestions, rather than proscriptive guidance.

- The current USDG doesn't acknowledge the necessary trade-offs inherent in many of the techniques it recommends

There are several instances of this in the USDG. Parklets, although desirable, may result in the loss of significant amounts of parking meter revenue ($500 to $3,000 per space per year), which is unmentioned. Parklets are still too new to foresee the potential liability impacts.[2]

Traffic signals are another example of where the USDG fails to consider the many trade-offs inherent in the art of good traffic engineering. Split phasing is mentioned[3], without noting that in most cases it increases delay for not only autos, but also pedestrians and bicyclists.

Increased delay is likely to reduce pedestrian and cyclist compliance with the signal, and possibly engender more risk-taking behavior (such as crossing against the light).

Page 103 ("Signalization") suggests that adding protected left-turn phasing for vehicles harms the crossing time for pedestrians across the side street and encourages crossing against the WALK signal; but no mention is made of the fact that most states have established their own warrants for protected left turn phasing, and there could be safety consequences of removing it contrary to warrants established in those states.

- Is selective in terms of the facts presented, and in a few cases is factually inaccurate

Issues regarding actuated signals and split phasing were noted above. While dismissing delay as a metric for the success of a street, the *Guide* doesn't mention that the amount of tailpipe emissions and greenhouse gases will also increase as delay or the number of motor vehicle stops increases. Increased stops also can result in higher crash rates, especially rear-end collisions. Rear-end crashes can result in a stopped vehicle pushing a vehicle into pedestrians.

Signal timing (i.e., coordination) for bicyclists may be very desirable (page 134), but no mention is made of the fact that cyclists' speeds may vary from less than 10 mph to more than 25 mph, depending on cyclists' ability, terrain, and other factors.

Speed enforcement cameras are said to be "highly effective" (page 141), but have proven highly unpopular in some states (Arizona) as well as legally prohibited in at least one other (California).[4]

On page 158, we are told that "level of service measures the delay experienced by motorists at an intersection," and, "as a metric, it is mono-modal." In fact, non-auto modes have had LOS measures since at least 1965, so it is not 'mono-modal,' and the *2010 HCM* goes a great deal further than previous HCM's to include extensive pedestrian, bicycle, and transit LOS measures, along with the auto mode. No mention is made of the fact that excessive delay at an intersection—to pick an example—also adversely affects transit passengers, cyclists, and pedestrians alike. If your bus gets stopped at a red light, it affects transit ridership—and costs the transit operator money.

The USDG states (page 113), "Right-turn-on-red restrictions may be applied citywide or in special city districts and zones where vehicle-pedestrian conflicts are frequent." Except that this would require a change in federal law, or require signage on a turn-by-turn basis, thus increasing sign 'clutter'.[5]

- Neglects some available traffic control tools, such as modern roundabouts and improved signal timing

The benefits of modern, well-designed roundabouts in an urban setting are largely ignored,[6] possibly because some of the *Guide* was originally developed for application in New York City.

Actuated signals come in for special disapproval.[7] The USDG states flatly that "fixed-time signals or passive detection are preferable to push-button detection." No explanation is provided why, and no discussion of alternative signal timing using actuated controllers is provided. Examples of improved timing could include pedestrian recall phase[8], time-of-day settings that call pedestrian phases, conditional service for pedestrians, and allowing a push-button to call a WALK phase on both (parallel) crosswalks (not just one leg), etc.

Some examples of tools that are missing[9]:

- Rectangular Rapid Flashing Beacons (RRFB) for unsignalized pedestrian crossings[10]
- Fluorescent yellow-green signs
- "Push and hold" pedestrian push buttons (to increase length of WALK interval)
- Use of special bus and bicycle signal indications

All of these are currently compliant with the MUTCD.

- Largely ignores maintenance, operational, and liability issues

Several liability issues are unmentioned: the potential issues with vehicle collisions with parklets go unmentioned, even though history suggests that parklets will not be free of litigation. Small radius corners are difficult for buses and trucks—with potential higher maintenance costs and liability involved (page 117).

The USDG places considerable emphasis on reducing vehicle speeds, but provides little guidance on how to do so. Street design for so-called 'target' speeds could raise liability issues if actual speeds are significantly higher (page 95). The 'target speed' concept is mentioned, but without guidance for how the designer determines it. Is it based on the designer's desires? The lowest possible speed? By a vote of the neighborhood association? Chosen by elected officials?

Conclusions and Omissions

Moving large volumes of traffic at the highest possible speed is not and should not be the only function of urban traffic engineers in 2014, and no one should pretend that it is. Although it catalogs some useful techniques, one objection to the USDG is that it sets up some 'straw man' arguments against street designs that most traffic engineers and designers do not endorse today (e.g., see page 94)[11]. The USDG also omits the costs of the improvements recommended, which would help both citizens and elected officials understand that not all of the treatments are the same.[12]

A significant omission in the USDG is the concept that a well-planned street system tends to make through-motorists want to use major arterials and freeways, rather than local and business district streets[13]. This makes them 'self-enforcing' and reduces traffic volumes and speeds on local and business district streets. Finally, no mention is made of the fact that providing constant speeds with a minimum of stops reduces air pollution, energy consumption, and greenhouse gas emissions. Minimizing delay should never be the only objective, but neither should it be completely ignored.

My suggestion is that NACTO consider having a broader range of experts look at the USDG, and that a second updated edition by issued as soon as it is possible to do so.

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[1] FHWA, *2009 Manual on Uniform Traffic Control Devices for Streets and Highways*, updated to March 2012, Section 2B.04 subsection 5, page 50. For the reasoning and other issues with unwarranted all-way STOP control, see Wolfgang S. Homburger, "The Stop Sign Epidemic," WesternITE vol. 30 no. 1 (January-February 1987), p. 1.

Another problem with AWSC is its uneven applicable absent any objective standards; instead political influence may be substituted for engineering.

[2] ITE immediate past international president is attempting to study this issue.

[3] USDG, page 12.

[4] Speed enforcement (but not 'red light' running) cameras have been prohibited in California for some time. See California Streets and Highways code, Section 21455.6(c): "The authorization… to use automated enforcement systems does not authorize the use of photo radar for speed enforcement purposes by any jurisdiction." See: http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH&sectionNum=21455.6, accessed 5/20/14. The language was adopted after a contentious debate in the state legislature over automated enforcement.

[5] As of 1992, right turn on red is governed federally by 42 U.S.C. § 6322(c) ("Each proposed State energy conservation plan to be eligible for Federal assistance under this part shall include: ...(5) a traffic law or regulation which, to the maximum extent practicable consistent with safety, permits the operator of a motor vehicle to turn such vehicle right at a red stop light after stopping, and to turn such vehicle left from a one-way street onto a one-way street at a red light after stopping."). The notable exception is that all turns on red are forbidden in New York City unless a sign is posted permitting it.

[6] 'Mini-roundabouts' are mentioned on page 99.

[7] USDG, pages 115, 127, and 132. The author understands that there is some inconvenience in having to push the button, or neglecting to do so when there is a crowd of people. However, it seems like a relatively small price to pay for the other benefits associated with actuated signals.

[8] 'Pedestrian recall' places an automatic call for a pedestrian phase and its associated vehicle phase. It can allow a pedestrian phase to appear even after the associated vehicle phase has commenced (in case the pedestrian arrives a few seconds after the paralleling vehicle phase has commenced). This avoids the problem where a pedestrian arrives just after the vehicle phase has started, or where there are a large group of pedestrians and no one has pushed the PPB. In light traffic conditions, it may result in inefficient operation, so can be programmed to operate by time of day during the heaviest pedestrian crossing hours (e.g., 7AM-7PM). When pedestrian calls are placed during most of the cycles, it has only negligible impact on vehicle operations and helps pedestrians.

[9] All examples are MUTCD-compliant. Note that the PPB example would not be compatible with a fixed-time signal.

[10] RRFBs are mentioned in passing (p. 110, middle column), but with no guidance on use.

[11] The author's opinion is that very few designers would use the design shown in an urban setting today.

[12] Even early guidebooks on neighborhood traffic control contained at least ballpark costs for this reason; see for example the City of Seattle's "Making Streets that Work—Neighborhood Planning Tool" that was released in 1996.

[13] See ITE, *Planning Urban Roadway Systems—A Proposed Recommended Practice*. Report RP-015C, June 2011.