# Reporting and Scoring of CDC-HAN Audit Tool – Key Indicators, v. 1-19-16

An overall summary is useful, i.e, with/without, etc. Analysis can look at block faces or combine block faces for segments. Combining is most practical, unless goal is to identify specific problem locations for remediation. Key indicators also dictate the Level of Walkability and Safety for any given segment, although in some instance, modifying factors may affect the rating. It may also be useful to identify the segments with the most problems (or most severe problems) since these might be priorities for intervention. For a route, the total score can only be as good as it weakest link.

Accordingly, segmented approach suggested:

- Overall look at quality of walking environment by segments

- Identification of specific segments with problems

- Extent to which segments can be combined into continuous routes that are safe and walkable; could map these
  - Lack of continuity a typical problem in rural areas or small towns

| Safety Domain – Segment Tool | Supportive Features | Problematic Features | Level of Walkability & Safety* [1-4]- | Modifiers to LWS, if any | Potential impact on LWS rating | Notes |
|---|---|---|---|---|---|---|
| | | | *Problem moves rating from 1(pristine) to identified # LWS classification 2-4); #s shown in LWS column reflect presence of problematic features to the left | | | |
| **Walkways (WW)** | Note that WW safety & walkability are moderated by adjacent roadway conditions. An otherwise pristine sidewalk cannot sufficiently compensate for multilane, high volume or high-speed traffic conditions that increase risk for pedestrians. | | | | | |
| Dedicated WWs (7) | #/% segments (or block faces) where present | #/% where missing | 4 | All affected by traffic volume and speed and type of roadway configuration. Also affected by maintenance. | | Dedicated, paved WWs are the gold standard, but other WWs in good condition may function very well and be safe for most people; accessibility is an issue for non-paved options |
| Other (8a-e) | | Frequencies for other options; could combine 8a-d in contrast to 8e | | | | |
| Other (8e) | | If 8e, then issues ei/eii | | | | |
| WW width (9) | #/% measuring 9 a-b 2 or 3 | #/% measuring 9a or b1 | 2-3 | | | Accessibility issue; wider better; standards change over time |
| WW surface (10) | #/% segments paved (10a3) | #/% unpaved (other options a1, a2, a4) | 3 | Maintenance crucial modifying factor; walkability/safety of paved surface can be greatly diminished by poor condition/design | | Some non-paved surfaces could be quite good for walkers, but less likely for mobility device users |
| WW buffers (11) | #/% where present | #/% where missing | 2 | Modifer for roadway issues; buffers enhance all WWs | | |

| Modifiable WW conditions (15-16, 19-21, 21) | Supportive Features | Problematic Features | LWS | Modifiers to LWS, if any | Potential impact on rating | Notes |
|---|---|---|---|---|---|---|
| Trip hazards (15) | #/% without hazards | #/% with hazards | | | | Typically can be resolved by public works, e.g., grinding down WW discontinuities, filling holes or replacing sections, addressing drainage issues, etc. |
| A few | | #/% with a few | 3 | Modifiable | | |
| A lot | | #/% with a lot | 4 | | | |
| Maintenance (16) | #/% with *no* or *minor* maintenance issue | #/% with *moderate* or *major* maintenance issue | 3 – moderate 4 - major | | | |
| Obstructions (19-20) | #/% without | #/% with | | | | |
| Permanent (19) | #/% without | #/% with | 4 | Public works often able to do work arounds for permanent obstructions | | Accessibility issue |
| Temporary (20) | #/% without | #/% with; Break out *some* or *many* for fuller description | 4 | Modifiable with neighborhood education, law enforcement or public works | | Accessibility issue |
| Slip hazards (21) | #/% without | #/% with | 3 or 4 | Modifiable, but can be challenging given changing conditions | | Neighborhood; may be seasonal |
| Railing/barrier (23) | | #/% where needed but missing | 3 or 4 | Readily modified | | Public works |
| **Other WW features** | | | | | | |
| Steepness/incline (17) | #/% level | #/% moderate slope | 3 | An area where functional status is important; what is a problem for one person may not be for another | | Incline is often a local given while cross slope is a design issue that could be fixed. |
| | | #/% steep | 4 | | | |
| Cross-slope (18) | #/% level | #/%  sloped | 3 | | | |
| | | #/% steep | 4 | | | |
| Driveways/alleys (24) | #/% 24 1-3 (5 or less) | #/% 24 4 (*6 or more*) | 3 | Surface Rx (26b) | Can augment safety | |
| Traffic vol (25) | #/% 25 (1 or 3) *light, moderate or periodic* | #/% 25-2 *heavy* | 2-3 | Volume and speed clearly related | | |
| WW slope (26a) | #/% level | #/& not level | 2-4 | May be modifiable | | |
| Curb ramps (14) | #/% with | #/% missing | 4 | | | Accessibility issue to be addressed by public works |

| Roadways (27-31) | Supportive Features | Problematic Features | LWS | Modifiers to LWS, if any | | Potential impact on rating |
|---|---|---|---|---|---|---|
| | Useful to look at segments/routes x roadway features. Could choose either type or speed as indicator, e.g., how many segments are located adjacent to challenging road types or where higher speeds constitute a risk factor? Does that proximity necessitate moderating the LWS rating for the segment? | | | | | |
| Type road | #/% 27 d-e | #/% 27 b | 4 | | | Worst configuration for peds |
| | #/% 27 f | #/% 27 a | 4 | Calming devices (31b) | Can improve LWS significantly | |
| | | #/% 27 c | 3 | | | City/county data |
| Traffic volume (28b) | #/%28b 1-3 | #/% 28b4 | variable | | | City/county data |
| Speed limit (29) | #/% 35 or less | #/% >36 | 3-4 | | | City/county data |
| | | | | Ped related signs (31d) | Can improve LWS somewhat | |
| Classification (28a) | | | | Can be used as proxy for speed/volume if needed, but difficult since municipalities vary in their classification criteria | | |
| Parking facilities | #/% 30b | #/% 30d (medium to large or garage) | 2-3 | Largely descriptive, but medium to large lots may affect safety and perceived safety; on street parking provides buffer for peds | | |
| **Crossings within segment** | | | | | | |
| Mid-block crossings (31f) | #/% existing | #/% existing but without 30' advance stop line (31g) | | | | |
| Ped. Bridges (31e) | #/% existing | | | Improve LWS potentially | | Judgment call here- Does ped bridge replace what would otherwise be a difficult crossing? Is it accessible and of good quality? |
| **Visibility/motorists (22)** | #/% with visibility | #/% without visibility | 3-4 | | | |
| | | | | | | |

| Wayfinding Domain | Item #s | Description | For Summary | Level of Walkability & Safety Indicators* |
|---|---|---|---|---|
| *Segment Tool* | | | **Summary of supports & problems** | |
| Supports -Continuity | Items 12-14 | # segments w/wo continuity | Total presence/absence across items | +2 for any given segment with "no" |
| | 31 a (optional to include) | Count cul-de-sac/dead end as wo continuity | Can include in above if desired | |
| Supports - Orientation/image | 32, 42 | # segments w/wo | If no features for orientation or if monotonous, aids (and problems) become more important. | |
| Supports -WF Aids | 33 | Total items by type | | |
| Problems -WF Aids | 34 | Total items by type/subtype | | |
| Problems -Lighting | 35, 36 | | | +1 |
| Problems -Other | 48 g-h | | Behavioral factors not easily remedied | |
| Transit | 37 b & c | If present, is marked (b) w route info (c)? | Total stops marked & with route info (Q _ is WF adequate at transit stops?) | |
| *Intersection Tool* | | | **Summary of intersection problems if any** | |
| Problems - Street signs missing, lacking visibility, | 1 (a, b) | Total of a1 + a4 + b-no | | +1 |
| Problems – Street signs w one or more other problems | 1 (d) | sum of d | | |
| Problems – intersection configuration | 2(a) – 5 way star or 6 way | | | |
| Problems – curb ramps | 3a2 or 3a3 | Sum intersections with no/missing ramps | Total intersections with no/missing ramps | +1 |
| Problems – Other crossing features (curb ramp features & Other) | 3a4-7, 5 b-d, 3a8 – count if NOT present | Total by type | | |
| Problems- lighting | 9a | | | |
| | | | | |
| | | | | |

* These are key problem indicators that move the Level of Walkability and Safety from Level 1 (pristine, highly walkable and safe) to a higher less desirable category (see description of levels). The LWS is assigned per segment or intersection. For a route, the total score can only be as good as it weakest link.

## Other Key Indicators (Older Adult Emphasis)

Note: *Absence of supports could necessitate adjusting some LWS ratings. Also, some features, e.g., places to rest are areas where improvements can often be made.

| Comfort/Disorder | Item # | | ? | LWS |
|---|---|---|---|---|
| *Comfort Supports* | | | | |
| Transit stop | 37a &b | Total segments with stops present & accessible ÷ # segments | Gives general idea how many blocks someone would have to walk w/o transit access | |
| Places to rest | 38b-d | Total segments with places to rest ÷# segments | Is there a place to rest on each segment or every other segment? | * |
| Trees/porticos | 39a | Total segments with present ÷# segments | Does each segment offer some shade? | * |
| Restrooms | 39e | Total segments with present ÷# segments | Gives general idea how many blocks someone would have to walk w/o restroom access | * |
| Eyes on street | 40b | Total segments with present ÷# segments | What proportion of segments have opportunities to be seen? Important for perceived safety. | |
| *Comfort Problems* | | | | |
| Loud sounds | 48d | % segments with problem | | |
| Crowded/chaotic | 48g | % segments with problem | Esp problematic for vulnerable; increase falls risk | * |
| Competing use walkways | 48h | % segments with problem | Esp problematic for vulnerable; increase falls risk | * |
| Daytime crime rate | City/county data | | Can be used to adjust WW ratings as needed | ** |
| Pleasant features absent | 41b | % segments with problem | | |
| Poor building maintenance | 43b | % segments with problem | | |
| Disorder indicators present | 44 | Total a-f; range for segments on route | | |
| Extent physical/social disorder | 45b,c 46 b,c | % segment with some vs. a lot | | |
| Air pollutants | 48a | % segments with problem | Esp problematic for vulnerable; asthma, cardiovascular, COPD | * |
| Industrial buildings | 3c, 4c | % segments with industry | | |

| Safety Domain - Intersection | Supports | Problems | LWS | Potential Modifier | Potential Impact on Rating | Notes |
|---|---|---|---|---|---|---|
| Controlled vs Uncontrolled (6a) | #/% controlled (6a) | #/% uncontrolled (6a) | 4 | Key ? for intersections as uncontrolled almost always less safe than controlled intersections. | | |
| Controlled Intersection Only (6b-e) | | | | Negative and positive modifying features below in red are pertinent to width, configuration, volume and speed. | | |
| Width widest leg in lanes (2b) | #/% with 2 or fewer lanes | #/% with 3-4 lanes | 3 | | | |
| | | #/% with more than 4 lanes | 4 | | | |
| | | | | Specially identified lanes: *(2c1)* Right turn or *(2c2)* Left turn | Context specific | Can add to pedestrian confusion |
| Configuration (2a) | #/% T (a) or 4-way (b) | #/% with 5-way (c) or 6-way (d) | 4 | Angled intersection (2c8) | Negative impact on rating | |
| | | | | Wide turning radius *(2c9)* | | |
| Traffic volume (8) | #/% a-c | #/% d | 2-4 | Especially wide lanes (2c6) | | |
| Cross-street speed (segment data (29) or per city) | #/% 35 or less | #/% >36 | 3-4 | Refuge islands (2c3) | Positive impact on rating | |
| | | | | Center median strip (2c4) | | |
| | | | | Curb extension (2c7) | | |
| Intersection Control (6) | | | | | | |
| Type control | #/% with traffic signal (6e) | #/% with yield (6c) | 3 | | Context specific, i.e., yield or stop signs could be entirely ok in some locations with low speeds and traffic volume | |
| | | #/% with stop (6d) | 2 | | | |
| Traffic circle, Roundabout (6b) | | #/% with roundabout | 3 | | | Can be challenging for peds |
| Signalization (if present (7) | | | | | | |
| Green arrows for dedicated vehicle turns present*(7a)* | | | | | Context specific | |
| Ped "Walk" signals *(7b)* | #/% with "Walk" (7b) | #/% without "Walk" (7b) | 2 | Ped push buttons present*(7c)* | | Desirable, but not always feasible |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Buttons accessible (7d) | Accessibility issue |
| | | | | Countdown signal (7e) | Desirable, but not always feasible |
| | | | | Audible walk signal (7f) | Accessibility issue |
| **Crossing time (7h)** | #/% with adequate time | #/% without adequate time | 2-3 | | Important for older adults with mobility challenges |
| **Behavioral Factors** | | #/% per type | | These factors negatively impact LWS; however, these observational data will likely be unreliable without some sort of time sampling. If observed, nonetheless, then these are public education and law enforcement issues. | |
| Fast turning traffic(8e) | Unreliable to count if "not observed", i.e., just because you failed to see it while auditing does not mean that it does not happen | | | | |
| Drivers failing to yield (8f) | | | | | |
| Parked too close to intersection (8g) | | | | | |
| Drivers stopping in crosswalk (8h) | | | | | |
| **Curb Ramps (3a-b)** | #/% with all corners (31a) | #/% with missing (3a2-3) | 4 | Could give some credit if *some* present, but still problematic | Accessibility issue |
| Ramp condition – transitions (3a8) | #/% with transitions*(3a8)* | #/% without transitions*(3a8)* | 2 | | |
| Ramp condition-problems (3a4-7) | #/% without specific problems | #/% don't line up (3a4) | 3 | | Poor design or maintenance issues |
| | | Poor condition(3a5) | 4 | | |
| | | Drainage (3a6) | 3 | | |
| | | Permanent obstructions (3a7) | 4 | | |
| **b. Crossing** | #/% marked (4a) | #/% unmarked(4a) | 2-3 | Faded markings (5d) negatively influence rating for marked CW. | |
| Condition crossing surface (5c) | #/% not poor | #/% poor | 2-4 | | Not unusual for WW condition to be good, but crossing surface poor |
| Temporary obstructions (5b) | #/% without obstructions | #/% without obstructions | 4 | | Safety/accessibility issue; should be fixed |
| Slope/cross-slope (5a) | #/% not steep (5a) | #/% steep (5a) | 3-4 | | |
| Marked CW features (4a) | #/% with high-vis. striping (4b) | #/% without high-vis. striping (4b) | | | |
| | #/% with advance stop lines (4c) | #/% without advance stop lines (4c) | 2-3 | Controlled | |
| | | | 4 | Uncontrolled | |

| | #/% with warnings (4d) | #/% without warnings (4d) | 2-3<br><br>4 | Controlled<br><br>Uncontrolled | | |
|---|---|---|---|---|---|---|
| | #/% with raised crosswalk (4e) | #/% without raised crosswalk (4e) | | | Context specific | Adds to safety, but reserved for specific apps |
| One-way street (2c5) | | | | | | Info only |
| **Crossing time (7h)** | #/% with adequate time | #/% without adequate time | 2-3 | | | Important for older adults with mobility challenges |
| Street Name Signage (1a) | | | | | | See wayfinding domain |
| **Visibility** | | | | | | |
| Lighting (9a) | #/% with lampposts/street lamps | #/% without lampposts/street lamps | 3 | | | Safety, accessibility & wayfinding issue |
| Poor visibility peds/motorists (9b) | #/% without poor visibility | #/% with poor visibility | 4 | | | See also segment visibility |
| Sign visibility (1b) | #/% visible | #/% not visible | 2-3 | | | Potentially correctable |