

**AUDIT TOOLS FOR RESEARCH ON  
BUILT ENVIRONMENT FEATURES TIED TO ACTIVE LIVING**

Audit tools can be used by researchers to measure features of the built environment that may be linked to physical activity. Several such audit tools have been developed. This table compares several different audit tools, in terms of which features they measure. The table was developed by Kristen Day, University of California, Irvine.

## COMPARISONS OF TOOLS

	<b>SPACES</b>	<b>Analytic Audit Tool</b>	<b>Irvine-Minnesota Inventory</b>	<b>U Maryland Urban Design Tool</b>	<b>PEDS</b>
Unit of analysis	Segment	Segment	Segment	Segment	Segment
Concepts measured	Types of buildings/features, walking and cycling paths, street assessment, overall assessment	Land use, transportation, facilities, aesthetics, signage, social environment	Accessibility, pleasurability, perceived safety from traffic, perceived safety from crime	Imageability, visual enclosure, human scale, transparency, complexity	Environment, pedestrian facilities, road attributes, walking/cycling environment, subjective assessment
Reliability	From paper	4/8 items with agreement $\geq 75\%$	All items in inventory with interrater reliability $\geq 70\%$	check papers	unknown
Method of collecting data	Paper & pencil (1 page)	Two versions: PDA and paper & pencil	Two versions: Tablet PC and paper & pencil	Paper & pencil (1 page)	Two versions: PDA and paper & pencil (1 page)
Time required to conduct	unknown	10.6 minutes per segment	(In California) 3–4 hours per setting; 15–20 segments per setting. (In Minnesota) 20 minutes per segment including travel, fieldwork, data entry, proofing.	20-person minutes per segment or 0.2 person hours per segment	unknown

**SPECIFIC ITEMS MEASURED IN EACH TOOL**

	<b>SPACES</b>	<b>Analytic Audit Tool</b>	<b>Irvine-Minnesota Inventory</b>	<b>U Maryland Urban Design Tool</b>	<b>PEDS</b>
<b>NEIGHBORHOOD IDENTIFICATION/LEGIBILITY</b>					
Presence of neighborhood monuments or markers, banners			Y		
Neighborhood legibility	Y				
Presence of wayfinding aids					Y
<b>LAND USES</b>					
Presence, types of residential land uses	Y	Y	Y		
Presence, types of educational uses	Y	Y	Y		
Presence, types, levels of public/recreational spaces		Y	Y	Y	
Presence, types of institutional/public/civic buildings		Y	Y		
Presence, types of commercial/retail uses	Y	Y	Y		
Presence, types of office/service uses	Y		Y		
Presence, types of industrial/manufacturing uses	Y		Y		
Presence, types of transportation facilities	Y	Y	Y		Y
Presence, types of major landscape features		Y		Y	
Presence, types of nature features	Y	Y	Y		
Integration of land use		Y	Y		
Predominant land use	Y				
<b>STREETS/TRAFFIC</b>					
Number of vehicle travel lanes	Y		Y		Y
Level of traffic volume of street					Y
Posted speed limit		Y	Y		Y
Road condition	Y				Y

Type of intersection/cul de sac	Y	Y	Y		Y
Parking restrictions/presence of parking	Y	Y			Y
Presence of alley			Y		
Presence of freeway over/underpass			Y		
Presence of pedestrianized street			Y		Y
Types of traffic/pedestrian signal system	Y	Y	Y		Y
Presence of traffic calming measures		Y	Y		Y
Presence of pedestrian cut throughs	Y		Y		
Presence, types of street markings for pedestrian crossings		Y	Y		Y
Presence, type of marking for mid-block crossing	Y		Y		
Perceived safety for pedestrian crossing			Y		
Perceived convenience for pedestrian crossing			Y		
<b>SIDEWALKS</b>					
Presence of sidewalks	Y	Y	Y		Y
Completeness of sidewalks		Y	Y		Y
Maintenance of sidewalks	Y	Y	Y		
Sidewalk width		Y			Y
Sidewalk connectivity					Y
Presence of curb cuts	Y	Y	Y		Y
Location of sidewalk	Y				Y
Sidewalk condition	Y				Y
Sidewalk materials/decorative paving	Y		Y		Y
Sidewalk obstacles	Y	Y			Y
Presence of sun/rain protection on sidewalks			Y		
Presence of sidewalk buffers		Y	Y		Y
Presence of alternative paths (other than sidewalks)	Y	Y	Y		Y
Width of alternative path		Y			

Quality, obstruction of alternative path		Y			
<b>BICYCLE FACILITIES</b>					
Availability of bicycle facilities		Y			
Presence of bicycle lanes		Y	Y		Y
Location, demarcation of bicycle lanes	Y	Y	Y		Y
Condition of bicycle lanes		Y			
Obstructions in bicycle lanes		Y			
Continuity of bicycle route	Y	Y			
Presence of bicycle parking facilities	Y	Y	Y		Y
<b>STEEPNESS</b>					
Grade/steepness	Y		Y		Y
<b>VIEWS/ENCLOSURE</b>					
Presence of open views, long sight lines			Y	Y	
Type of views	Y				
Attractiveness of views			Y		
Degree of enclosure				Y	Y
<b>PUBLIC SPACES/PUBLIC LIFE</b>					
Types of public/gathering spaces, active uses			Y	Y	
Accessibility of public spaces to public			Y		
<b>AMENITIES</b>					
Presence of outdoor dining areas		Y	Y	Y	
Presence, number of street furniture/outdoor amenities		Y	Y	Y	Y
Presence, quality of bus stops		Y			Y
Presence of public restrooms		Y	Y		
Types of playground, sports equipment		Y			
Presence of public telephones		Y			
<b>STREET TREES/LANDSCAPING</b>					
Amount of street trees	Y		Y		Y
Height of trees	Y				
Amount of shade from street trees			Y		Y

Number of small planters				Y	
<b>ARCHITECTURE/BUILDING CHARACTERISTICS</b>					
Presence, number of buildings			Y	Y	
Building height			Y	Y	Y
Building setbacks					Y
Proportion of windows/blank walls at street level			Y	Y	
Predominant use of parking structure on ground floor			Y		
Presence of front porches			Y		
Presence, prominence of garage doors			Y		
Attractiveness of environment	Y	Y	Y		
Comfort of environment		Y			
Number of building, accent colors				Y	
Presence, proportion of historic buildings			Y	Y	
Number of buildings with identifiers				Y	
Presence of interesting, varied architecture/design	Y		Y		
Type of building shapes				Y	Y
<b>PARKING, DRIVEWAYS</b>					
Presence, number of parking structures, lots	Y	Y	Y		Y
Need to walk through parking lots					Y
Presence, volume, visibility of driveways	Y	Y	Y		Y
<b>MAINTENANCE/APPEARENCE</b>					
Maintenance of buildings, lots	Y		Y		Y
Presence of abandoned buildings, lots		Y			
Amount of litter	Y	Y	Y		
Y					
Visibility of dumpsters			Y		
Presence of billboards		Y	Y		
Types of signs		Y			

Presence, type of overhead wiring			Y		Y
<b>SAFETY CONCERNS</b>					
Presence of bars, adult shops, etc.			Y		
Presence of abandoned buildings, lots			Y		
Presence of bars on windows, broken windows		Y	Y		
Amount of graffiti		Y	Y		
Presence of neighborhood watch signs		Y			
Presence of disorder features (beer bottles, syringes, etc.)		Y			
Visibility from surrounding buildings	Y				
Perceived safety while walking, bicycling			Y		Y
<b>LIGHTING</b>					
Presence, type, location of outdoor lighting	Y	Y	Y		Y
<b>PEOPLE</b>					
Number of people, pedestrians		Y		Y	
Number, activities of children		Y			
Number, activities of teens		Y			
Number, activities of seniors		Y			
Presence of people interacting		Y			
Presence of people acting hostile		Y			
Presence of aggressive drivers		Y			
<b>DOGS</b>					
Presence of dogs, stray animals		Y	Y		
<b>SMELL/POLLUTION</b>					
Presence of unpleasant smell			Y		
Presence of air pollution		Y			
<b>NOISE</b>					
Noise levels		Y		Y	
<b>HEALTH SUPPORT</b>					
Physical activity messages, billboards,		Y			

events					
Tobacco, alcohol billboard		Y			
Fast food billboard		Y			
<b>WALKING QUALITY</b>					
Attractiveness for walking					Y
Difficulty for walking	Y				
<b>CYCLING QUALITY</b>					
Attractiveness for cycling	Y				Y
Difficulty for cycling	Y				

References:

Active Living Research website (Tools and Measures) and on the following publications:

Pedestrian Environment Data Scan.

Pedestrian Environment Data Scan (PEDS) Tool. Background document. Available from Kelly Clifton, University of Maryland.  
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Clemente O, Ewing R, Handy S, Brownson R, & Winston E. (2005). Measuring urban design qualities—An illustrated field manual. Princeton, NJ: Robert Wood Johnson Foundation [on-line]. At:  
[http://www.activelivingresearch.org/index.php/Tools\\_and\\_Measures/312](http://www.activelivingresearch.org/index.php/Tools_and_Measures/312). Accessed on February 8, 2006.

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[http://www.activelivingresearch.org/index.php/Tools\\_and\\_Measures/312](http://www.activelivingresearch.org/index.php/Tools_and_Measures/312). Accessed on February 8, 2006.