Pedestrian Environmental Quality Index for Android Smartphones Toolkit for Implementation

		D 0 7
Glossary of key terms	This lists the terminology used in the PEQI assessment	Pg 2-5
	and training, along with definitions.	
Data collection protocol	This explains how to use the PEQI instrument in a new	Pg 5-14
	study area. It includes a complete step-by-step	
	description of how to scope and plan a new project.	
PEQI data collection	This is a printable version of the questions you will see	Pg 15
Intersection Form	on the PEQI phone application forms. (available in	
(sample)	English & Spanish)	
PEQI data collection	Same as above	Pg 16-18
Segment Form (sample)		

PEQI App Full Protocol UCLA v2 Table of Contents

Android smartphone PEQI application and tutorial

can be downloaded from: <u>www.peqiwalkability.appspot.com</u>

Additional Items Needed for the PEQI

can be downloaded from: http://www.coeh.ucla.edu/node/127

Training slides	This PowerPoint presentation can be used to train new	see
	PEQI data collection volunteers. (English & Spanish)	website
		above
Illustrated Guide	This handout is useful during the training and for users	see
"Cheatsheet"	while collecting data. (English & Spanish)	website
		above
Training Quizzes	These PowerPoint Intersection & Segment quizzes can	see
	help to refresh or reinforce your trainings.	website
		above

Glossary of Terms

Term	Definition
abandoned buildings	A building which appears to be uninhabited and uncared for, often with boarded windows and/or a temporary chain-link fence surrounding its lot.
additional pedestrian signage	any sign about pedestrians
bike lanes	A designated place for bikes to ride on the street.
bike racks	A designated place for bikes to park, usually a metal U- shaped object bolted to the sidewalk.
buffer	A distance of 2-3 feet between the pedestrian sidewalk and moving motor vehicle traffic. Often this is a grassy median, parallel street parking, and/or a bike lane.
bulbouts	Where the curb and sidewalk are extended into the street at an intersection in order to reduce the distance pedestrians have to cross (see picture).
chicanes	A type of traffic calming feature which creates a serpentine path down the street, slowing traffic (see photo).
construction sites	Anywhere that construction is impacting the quality of being a pedestrian on the street. May be on the street or sidewalk itself, or a nearby building/lot.
crossing speed	How fast a pedestrian must be moving in order to cross the intersection in the allowed time.
crossing time	The time pedestrians are allowed to cross the intersection by the signal.
Crosswalk	a designated place for pedestrians to safely cross the street, usually marked on the street surface in using paint
crosswalk scramble	A special type of signal where motor traffic stops in every direction while pedestrian traffic is allowed to go in every direction at once.
curb cuts	Where pedestrians exit the sidewalk to cross the street at an intersection, a curb cut is a part of the curb shaped like a ramp that allows wheelchair access.
curbs	A part of the street hardscape preventing cars from driving from the street onto the pedestrian areas.
drains & dips	In this case, any imperfection in the street surface which forces motor traffic to slow down. Particularly storm drains.

driveway cuts	Where the curb is broken in order to allow traffic to pass into and out of driveways	
illegal graffiti	Graffiti is distinct from art (usually) because of its aesthetic qualities; it is informal and illegal.	
Intersection	place where two streets come together.	
Intersection identifiers	Unique identification numbers (or letters) used to identify each intersection in this PEQI study.	
intersection length	The distance from one curb to the other across an intersection.	
ladder crosswalks (aka zebra- stripe crosswalks)	Crosswalks with large stripes painted in them.	
litter	Trash on the street and sidewalk.	
major graffiti	Major graffiti includes large illegal graffiti, either mural- style or gang-style or otherwise.	
margin	The part of the street hardscape in between the sidewalk and the motor vehicle area.	
medians	A strip of land, usually landscaped, in between the two directions of traffic on a street.	
mini-circles	A type of intersection where motor traffic moves around a small circle.	
minor graffiti	Minor graffiti includes very small "tagging" on signs, posts, walls, and newspaper stands. It also includes graffiti stickers and small pieces of spray-painted graffiti.	
no turn on red signs	A sign indicating that it is not legal to make a right-turn on a red stoplight at this intersection.	
partial closures	Where motor traffic is prohibited from driving on part of the street segment.	
pavement treatments	A different texture or color or material in the pavement at pedestrian crossing areas, designed to be aesthetically pleasing and hilight the safe area for crossing.	
pedestrian	a person who is on foot or is using a wheelchair to move down the street.	
pedestrian refuges	A place where pedestrians can safely wait to cross all or part of a street. Often these are place on medians at large streets.	
pedestrian signal	part of a stop light that tells pedestrians when they have the right-of-way	
pedestrian-scale street lighting	Street lighting that illuminates the pedestrian areas of the street (does not include the large overhead lights that are intended to illuminate the motor vehicle part of the street).	

PEQI app	This refers to the application that you will download onto your Android smartphone. It is what you will open and use to fill out the PEQI intersection and segment forms.
perceived walkability	Your overall impression of how much the physical environment supports and encourages walking on this street segment.
permanent sidwalk obstruction	Any obstruction which cannot be removed readily, such as a large pole or fence.
planters/gardens	In this case, any well-tended landscaping should be counted as a garden or planter.
public art/historical sites	Any attractive public artwork, fountain, historical site, or historic building on this street segment.
public seating	A bench or other seating designed to be used by the public, including bus stop benches.
right-of-way	Laws and conventions governing who has precidence, or the right to proceed first through traffic lights and other traffic settings.
roundabouts	A type of intersection where motor traffic moves around a large circle.
rumble strips	A pavement treatment which makes noise when it's driven upon, alerting motorists to be aware.
Segment, or street segment -	this is the part of a street in between two intersections.
semi-diverters	Barriers preventing the movement of motor traffic in certain directions only; for example bollards which prevent a right turn at an intersection.
sidewalk	The part of the street hardscape that is designed for pedestrian use.
sidewalk impedement	Anything in the surface of the sidewalk that might obstruct a pedestrian's smooth motion down a sidewalk or pose a tripping hazard.
sidewalk obstruction or large sidwalk obstruction	any object which reduces the width of the sidewalk so that two people could not walk side-by-side past it, or that reduces the overhead clearance so that someone would have to duck to pass under it.
sidewalk surface condition	The smoothness of the surface of the sidewalk.
signal	traffic light
speed enforcements	Any sign or other special reminder/enforcement of the speed limit.
speed humps	A bump or hump in the street designed to slow motor vehicles down.

speed limit	The maximum allowed speed on this street.	
speed tables	A sidewalk which is built on top of a wide speed bump.	
stop light	The electronic signal directing traffic at an intersection; always includes signals for motor traffic. May also include signals directing pedestrian traffic.	
stop signs	A sign indicating that motor traffic must come to a stop at an intersection.	
storefront/retail use	Any retail establishment whose entrance is on the street segment.	
Street segment identifiers	Unique identification numbers (or letters) used to identify each street segments in this PEQI study.	
stride length	The number of feet in each of a person's steps.	
temporary sidewalk obstruction	Any obstruction which could be removed easily, such as a car, trees and shrubs, or temporary construction.	
traffic calming feature	any street feature which slows the speed of traffic, increases dirver aweareness, increases pedestrian visibility, or provides extra safety for pedestrians.	
two-way traffic	Traffic that moves in two directions on the street (as opposed to one-way traffic)	
vehicle lanes	Lanes are designated to keep motor traffic orderly. They do not need to be painted on the street to be counted. Do not count dedicated turning lanes.	
visually attractive	Your overall impression of how visually attractive the street segment is.	
Walkability	the physical environment's ability to support and encourage walking.	
width of sidewalk	The measured width of the sidewalk in feet and inches. It should be measured at the middle of the block, not at the intersections where it is often much wider.	

Data collection protocol

This document explains how to collect data using the PEQI application for Droid smartphones (PEQI app) in a new study area. It includes a complete step-by-step description of how to scope and plan a new project.

Please note that the PEQI app is an automated adaptation of the original paper version of the PEQI instrument. It was created to minimize data collection errors and save time during data entry and analysis. If you are interested in seeing the inner-workings of the PEQI process that is completely automated via the PEQI app, please refer to the paper version site: www.coeh.ucla.edu/node/127

Introduction to the PEQI instrument

What it is and what it can do for your community.

The Pedestrian Environmental Quality Index (or "PEQI") is a survey of the street environment from the perspective of pedestrians. This survey allows a community to collect specific data about the elements of the physical environment that determine "walkability" of their neighborhood. It's based on trained observers who fill out a set of specific questions about the elements they see on each block and intersection in your study.

This information can be aggregated to produce an index of walkability, known as the PEQI. Some examples of the data that are captured are displayed on a map and shown below.

Data about walkability can be used to identify priority areas for improving the walkability of an area. Either the individual data elements or the index, or both together, can be used to show what elements and what specific streets/intersections need the most help.

The PEQI is designed to be collected by volunteer data collectors. The complete toolkit, available at <u>www.coeh.ucla.edu/node/127</u> includes a training to instruct data collectors in how to fill out each of the items on the form on each block and intersection in your study area. It also includes the form itself.

PEQI was developed in 2008 by the San Francisco Department of Public Health. The original survey instrument and materials about its development are available at their website: <u>http://www.sfphes.org/HIA_Tools_PEQI.htm</u>

The PEQI was modified for use in Los Angeles by Malia Jones, MPH. Key changes were made to the original instrument in order to make it applicable to the Los Angeles Environment.



Sidewalk Condition Pedestrian Environmental Quality Assessment, 2009

CJ Walkability Index--Segments Pedestrian Environmental Quality Assessment, 2009







Step 1. Scoping

What is the area we will study?

First thing, you should go out onto a nearby block with the PEQI form and a pencil and try to complete it. This will give you a very good sense of what is involved with the form and what you will need.

Once you have a sense of what is on the form, the first step in performing a PEQI assessment in your neighborhood is to identify the area of study—that is, what blocks and intersections will we need to capture data about? When deciding what area to include in your assessment, think about the following:

- What areas do key stakeholders want data about? What are our priority areas? What areas are most amenable to change?
- How many volunteers will I have? How much time will they have to give?
- How much time do I have to spend organizing the project?

The PEQI is best collected by teams of at least 2 volunteers working together. Each team can probably collect about 1/2 linear miles of street in one data collection session, lasting between 2 and 4 hours. So if you decide to capture 3 linear miles of street, you will need to have 12 volunteers at your data collection event.

3 miles / $\frac{1}{2}$ miles per team = 6 teams of at least 2 people = 12 people

Mark out the study area on a map. It can be helpful to draw on the map what areas you will assign to each data collection team to give you a sense of how many volunteers to recruit.

Step 2. Tailoring the survey

At this time it is not possible to manipulate the survey questions on the PEQI app. If you would like to make changes to the survey, you will need to use the paper version of the forms which can be edited in Microsoft Word.

Step 3. Planning the data collection

Next you will need to plan your volunteer training and data collection event.

Logistics

You will need to set up an account at <u>www.peqiwalkability.appspot.com</u> The "Demo" tab at the top of the webpage gives you detailed instructions on how to set up your account, download the Droid application onto your groups' smartphones, and how to upload and save your data.

In addition to a smartphone with the PEQI app installed, each team will also need:

- 1 tape measure, at least 12 feet long
- 1 stop watch

Training takes two hours. Data collection usually takes between 2-4 hours for each $\frac{1}{2}$ mile segment (including the intersections). We have performed training from 10 am – 12pm, followed by a break and lunch, followed by the data collection event in the afternoon. This works fairly well. We have also conducted an evening training, followed by morning data collection. It is important to conduct data collection soon after your training, to make sure your volunteers remember how to fill out the forms.

You may want to consider the liability situation of your study. When the first Neighborhood Council (NC) project was completed in 2009, NC events were covered by the City of Los Angeles' liability policy. Your situation might be different.

Assigning your study area to teams

It is <u>EXTREMELY IMPORTANT</u> that your data collectors accurately identify the <u>PROJECT NAME EXACTLY</u> as it was spelled on the project pagewebsite, on each and every form that is filled out. In fact this is the most important thing they will do. The PROJECT NAME is the identifier used to direct your forms to your PROJECT PAGE when you upload them after data collection. If the PROJECT NAME is not EXACTLY as it was spelled on the PAGE the forms will have nowhere to go and get lost in cyberspace.

To help you divide up your teams to cover different areas of your neighborhood, it is useful to label all the street segments and intersections you wish to survey.

How do you identify segments and intersections? Label each street segment in your study area with its own unique number, and each intersection with its own unique letter. It is helpful to write them on a map.

Assign a set of segments and intersections to each team. You should do this in advance of the training, because it takes some time to complete. Try to divide the study area evenly across your teams according to how much distance they will have to cover. For example:

Team #	Intersections	Segments
1	a, b, c, d	1, 2, 3, 4, 5
2	e, f, g, h	6, 7, 8
3	i, j, k	9, 10
4	l, m, n, o, p	11, 12, 13, 14, 15

Prepare a map for each team indicating which street segments and intersections they will be responsible for. You may even want to fill in the segment and intersection ID's on the forms they will use, and include these in a packet that you will give to the team.

Step 4. Training your volunteers

Use the Training Slides PowerPoint found at <u>www.coeh.ucla.edu/node/127</u> to train your volunteers. The first section is about walkability and why it is important for health. The second section, which is much longer, goes through each item on the PEQI form one at a time, providing instructions about how to answer the questions. You will also need to review the "Demo" found at <u>www.peqiwalkability.appspot.com</u> to help your volunteers understand how to enter the data into the phones, take pictures, change answers to questions and save and upload their data. At the end of training, you should lead your volunteers to a nearby block and have them complete one full set of practice forms. Stand nearby to answer questions as they come up.

Training and practice should take about 2 hours in total, depending on your volunteers. This may vary depending on your volunteers' comfort with the training materials.

You should practice the training and practice completing the entire form to make sure you understand how to collect each item in advance of your training event. It is recommended to practice with your volunteers on the street. However, if group size or other factors do not allow, a set of quizzes are included in the toolkit.

For training, you will need:

- A projector and computer to run the presentation
- Practice phones with the PEQI app installed
- tape measures, stopwatches to use for practice
- Supplies to mark out a stride length measuring range, at least 25 feet long. We have used tape applied to a carpeted floor and marked with a marker, and chalk applied to a sidewalk.

Before training begins, mark out a stride length measuring range on the ground. Place a line across the beginning of the range and mark it with the word "Start". Then use a tape measure to measure in a straight line across the floor. Mark the following distances:

At this distance	mark this number
120 inches	1 feet
130	1.1
140	1.2
150	1.3
160	1.4
170	1.5
180	1.6
190	1.7
200	1.8
210	1.9
220	2.0
230	2.1
240	2.2
250	2.3
260	2.4
270	2.5
280	2.6
290	2.7
300	2.8

During the training, you will have each of your volunteers stand with her heels at the "start" line. Then she will take 10 natural steps and stop. The place where she stops will be marked with her stride length in feet. Round to the nearest marker. Keep a list of your volunteers stride lengths as you may need to remind them of their stride length on data collection day.

Step 5. Collecting Data

After your volunteers have been trained, assign them to teams and give them their materials—phones, pencils, clipboards, tape measures, stop watches, name tags, and area assignments. Tell them to complete each of their team's assigned segments and intersections, and return their completed forms at a specific time and location.

Step 6. Uploading your Data

The PEQI project website does all the data analysis and mapping for you. All you need to do is go into the phones and select "Send Saved Data". Within a minute or two you will be able to see your data on your project website by clicking the "Update Data" button. The Demo tutorial on the website explains this process in detail.

Step 7. Data analysis and mapping

The PEQI project website does all the data analysis and mapping for you. By clicking on your Project, you will be able to View and Save your data as Microsoft Excel spreadsheets. You will be able to View your Map on the Project Website and also Save your Map as a Google Earth KML file. The Demo tutorial on the website explains this process in detail.

Step 8. Presenting your results

Once you know exactly what the walkability situation of your neighborhood is, present your results to your stakeholders! Be sure to highlight the elements they identified as being most important to them, and suggest approaches to fixing the problems. For example you might notice that almost every segment had some graffiti. A graffiti cleanup program might be a good approach to improving the physical environment in this case. Or, you might notice that many of the intersections did not allow enough time for pedestrians to safely cross the street. You can use this information to ask the City to make them safer.

PEQI: Intersection Form (sample only- download phone form from website)							
Team (names):						Date:	
Intersection ID: and This is the intersection of : and Street 1 Street 2							
		() directions	1 directions	2 directions	3 directions	4+ directions
1. Crosswalks							
2. Ladder cross	swalks						
3. Pedestrian signals	a. WITH countdov b. NO	wns					
4. Stop signs		wns					
5. No Turn On signals/signs6. Curb cuts at crossings	Red pedestriar	n					
7. Signal at int	ersection	[⊐yes □no•	→ if no, skip to	item 8		
Cross street <u>ONLY</u> with a green light or walk signal. Measure across larger street. a. Crossing time: Measure crossing time (in seconds): seconds b. Crossing distance: Measure crossing distance (in paces): paces Length of my stride: feet in my stride							
8. Crosswalk so	cramble		□yes □n	0			
9. Intersection Calming Featur	n Traffic res	Yes	Yes No Image: Description of the system of the s				
Indicate if any of following are p	 Indicate if any of the ollowing are present I speed tables, speed humps or speed bumps I bike lane at intersection I partial closures I drains, dips or other unintentional features that slow traffic I curb extensions/bulb-outs 						
			her (explain:	USSWAIK)
10. Additional pedestrians	signs for		yes □ n	0			

PEQI: Segment Form (sample only- download phone form from website)			
Team (names):			Date:
Segment ID:			
This street is	-		
Name	of this street		
Between: Cross Street	and	Cross Street 2	
Vehicle Traffic			
11. Number of lanes	4 or more lane	25	
	3 Ianes		
Do not include turn only lanes	2 lanes		
	🛛 1 lane		
	no lanes		
12. Two-way traffic	🗆 yes 🛛 no		
13. Vehicle Speed /	🔲 not posted	🔲 10 mph	🔲 35 mph
Posted Speed Limit		🔲 15 mph	🔲 40 mph
		🔲 20 mph	🔲 45 mph
		🔲 25 mph	🔲 50 mph
		🔲 30 mph	🔲 55+ mph
14. Street Traffic	Yes No		
Calming Features		dian 	
		les, speed humps or spe	ed bumps
Indicate if any of the following are present	drains, dip	os or other unintentiona	I features that slow traffic
jonowing are present			
		rips	
		it enforcements	,
Sidewalks	other (explain	:)
	1		
15. WIGTH OF SIGEWAIK	1	\Box loss than 5 feet	
	1	$rac{1}{2}$ 5 feet -7 feet 11 incl	has
	- 	$\frac{1}{2} 8 \text{ foot} = 11 \text{ foot} 11 \text{ ind}$	rhes
	۱ ۱	$\frac{1}{2} 12 \text{ feet or more}$	
	-	_ IZ IEEL UI IIIUIE	

16. Sidewalk <u>surface</u> condition	no sidewalk
An impediment is anything which poses a tripping	n_{ng} significant impediments in surface
hazard or interrupts the smooth surface of the	few impediments in surface
Choose only one option from the right	no impediments in surface
17. Large sidewalk <i>obstructions</i>	no sidewalk
An obstruction is any object which reduces the	permanent obstructions
width of the sidewalk or hangs low so that peop	de temporary obstructions
must duck to pass under while on the sidewalk.	both permanent and temporary obstructions
Choose only one option from the right.	no obstructions
18. Presence of curb	□ yes □ no
19. Driveway cuts how many present	driveway cuts
20. Trees	 Continuously lined
Choose the one that best describes this street	a few trees; sporadically lined
	no trees
21. Planters/gardens public and private	
22. Public seating including bus stops	🗆 yes 🗆 no
23. Presence of buffers	Yes No
	L L bike lane
Indicate if any of the following are present	□ □ □ parallel street parking—not time-restricted
	☐ ☐ parallel street parking—time-restricted
	Grassy or paved margin
Land Use	
24. Storefront/retail use	shops or businesses of any type
Count the number of stores	
25. Public art/historical sites	🗆 yes 🔲 no
Safety and aesthetic qualities	
26. Illegal graffiti	Major graffiti
	Little or no graffiti
27. Litter	□ yes □ no

28. Pedestrian-scale street lighting	🔲 yes, private
Choose only one option from the right.	🔲 yes, public
	yes, both private and public
	no pedestrian-scale street lighting
29. Construction Sites	🗆 yes 🔲 no
30. Abandoned/boarded up buildings	□ yes □ no
31. Vacant Lots	□ yes □ no
32. Bike rack(s) present on this street segment	yes no
Perceived Walkability: Please circle th segment.	ne number that your team thinks best describe this street
33. Street segment is visually attractive for walking.	Strongly AgreeAgreeDisagreeStrongly Disagree1234
34. Street segment feels safe for walking.	Strongly Agree Agree Disagree Strongly Disagree 1 2 3 4
35. Are there obvious strong odors anywhere on this street segment (e.g., vehicle exhaust, urine stench, rotting garbage, etc)?	No Odors A Little Odor Some Odors A lot of Odors 1 2 3 4
36. How noisy do you find this street segment?	No Noise Little Noise Some Noise A lot of Noise 1 2 3 4
37 . On a scale of 1 to 10, how walkable do you find this street segment?	Not Walkable Very Walkable 1 2 3 4 5 6 7 8 9 10