



City of Barre, Vermont
"Granite Center of the World"

Agenda for the Planning Commission

Meeting held on Thursday, April 8, 2021 ~ 6:30 PM

Remote Participation Only ~ Join Zoom Meeting

<https://zoom.us/j/93610096782?pwd=NUdWbUJzSE9meG5lV0pMQ2QwQ0E5Zz09>

Meeting ID: 936 1009 6782

Passcode: 035627

Phone: 1 929 205 6099 US (New York – Long distance rates may apply)

1. Call to Order
2. Adjustments to the Agenda
3. Public Comment (*for something that is not on the agenda*)
4. Old Business:

Page 2 A. Approve meeting minutes of March 11, 2021

5. New Business:

Page 5 A. Bike Path: status of city bike paths (Recreation Director)

Page 18 B. Long-range Bicycle and Pedestrian Plan Goal (Recreation Director)

Page 30 C. City-Wide Parks and Recreation Plan (Recreation Director)

Page 37 D. City-wide Pedestrian Environment Quality Index (PEQI) and Complete Streets Assessment (Recreation Director)

Page 105 E. City-Wide Open Space Plan (Recreation Director)

6. Staff Updates
7. Roundtable
8. Adjourn

1 **REGULAR BARRE CITY PLANNING COMMISSION MEETING**
2 **Thursday, March 11, 2021 at 6:30 pm**
3 ***Remote Participation via ZOOM Platform***
4

5 The regular meeting of the Barre City Planning Commission was called to order virtually by the
6 Vice-Chair David Sichel at 6:30 pm. In attendance participating via the Zoom Video Conferencing
7 platform were Commissioners Rachel Rudi, Michael Hellein, Jackie Calder, Thom Lauzon, and
8 Amanda Gustin. Visitors included Carol Dawes, Barre City Clerk/Treasurer; Bill Ahearn, Public
9 Works Director; Jake Hemmerick, Barre City Ward 1 Councilor; Steven Mackenzie, Barre City
10 Manager; Janet Shatney, Planning Director, and members of the public.

11 **Adjustments to the Agenda:** Commissioner Calder requested adding the Berlin Mall New Town
12 Center's letter of support that went to the Council, and was added after reviewing the February
13 meeting minutes.

14 **Public Comment (*for something that is not on the agenda*):** there was no request by any of the
15 public in attendance to speak or address the Commission.

16 **Old Business Approve meeting minutes of February 11, 2021:** A motion was made by
17 Commissioner Lauzon and seconded by Commissioner Calder to approve the February meeting
18 minutes as presented, with no discussion, motion carried unanimously.

19 **Town of Berlin's New Town Center and Barre City letter of support:** Director Shatney
20 explained that the letter was presented to the city council under the Consent agenda, a motion was
21 made to support, but failed for a lack of a second with no further discussion. Commissioner Hellein
22 noted that the Downtown Board would be hearing Berlin's application on March 22, 2021. He
23 also volunteered that he could explain why he voted no to sending the letter, but the Commission
24 moved on.

25 **New Business: Tax Increment Financing – Carol Dawes, City Clerk/Treasurer; Steve**
26 **Mackenzie, City Manager:** Clerk Dawes went through what TIF (Tax Increment Financing) is,
27 what it means and how increment works. A TIF District is an economic development tool,
28 controlled by the VEPC (Vermont Economic Progress Council) which is part of the Agency of
29 Commerce and Community Development.

30 A TIF district is a defined by an area within a municipality where public infrastructure projects are
31 undertaken in support of private development initiatives. The debt service for the private and for
32 the public infrastructure projects is covered by property tax increment increases that are generated
33 by the growth in the grand list from the private development, as an example say somebody bought.

34 Questions were asked about the nature and frequency of the audit, what kinds of information we
35 expect to receive from the audit, what was the original TIF amount, what is left and what is the
36 increment.

37

38 In the TIF plan itself, there are two projects remaining. One is completion of the rest of the
39 Merchants Row parking lot from Depot Square to project Prospect St and the other is the
40 construction of a parking garage over on the Pearl Street parking lot. Councilor Hemmerick
41 inquired about the master plan, and if it was a flexible design, which Manager Mackenzie answered
42 it was.

43 **New Business: Paper and Accepted/Unaccepted Streets – Bill Ahearn, Public Works**
44 **Director:** Director Ahearn began by explaining that a paper street grew from drawing streets and
45 lots on paper with little regard to the actual lay of the land. People brought forward ideas on how
46 the lots would be developed, then identify where the streets were supposed to go, then identify the
47 lot and the lot dimensions and then create a plat of their subdivision with the city. Those lots
48 would then begin to sell, and typically the roads and utilities that completed their land would be
49 developed, and that all occurred in the City between 1910 and 1935. Streets are laid out on ledge
50 outcroppings, and we have instances where houses are in the middle of city right-of-ways. There
51 are 210 lots in existence on those paper streets that are undeveloped. There's over 16,000 feet of
52 paper streets in the city, and basically the city has an interest in them. People who front on them
53 have an interest in them, and people have lots that are accessible through that agreed upon right
54 away.

55 Commissioner Sichel noted when he worked in Ohio, an instance occurred where a building permit
56 for a house would not be issued until the street was put in to the municipal standards, and the hope
57 is that the City follows this good management practice as well. Discussion occurred about street
58 widths, right-of-way widths, emergency services, vehicle access, a cost sharing process for the
59 installation of utilities, and standards for certain lengths of those utilities.

60 Accepted and unaccepted streets are different in that an accepted street is that which the city owns,
61 has utilities under and maintains. An unaccepted street is one that may be owned by someone else,
62 or that the owner can no longer be found. Questions circled around maintenance and paving an
63 unaccepted street, and Mr. Ahearn stated that in a particular instance, the city paved a section of
64 unaccepted street on three (3) occasions, and maintain it continuously.

65 Commissioner Gustin suggested that by raising these questions made tonight would be a good
66 framing footwork for the next conversation, and perhaps Mr. Ahearn and Director Shatney could
67 come up with a list of things that the Planning Commission could delve into, as it would be most
68 helpful to the process forward.

69 **Review Next Steps Summary Table for upcoming meeting items:** Discussion began with
70 suggestions for better ways to get the information out regarding meetings and their topics.
71 Commissioner Calder suggested that an informative narrative be on Front Porch Forum and the
72 newspaper, in addition to the agenda that gets published. It was agreed to save the Work Table for
73 another meeting, and take a deeper dive into paper streets.

74

75 **Staff Updates:** In addition to what was included in the packet, Commissioner Gustin asked why
76 were old permits paper being deteriorated, and Director Shatney explained where the Planning,
77 Permitting and Assessing storage locations are, in the old area of the Police Department.

78

79 **Roundtable:** Commissioner Gustin mentioned that she attended the book discussion group at the
80 Aldrich Library on walkable cities, and found it was extremely interesting and so they're going to
81 be going forward quarterly with books on building community.

82 **Adjourn:** A motion was made by Commissioner Lauzon and seconded by Commissioner Rudi to
83 adjourn at 8:14 pm. *motion carried unanimously.*

84

85 There is an audio and video recording of the meeting available. The meeting was recorded by the
86 video conference platform.

87

88

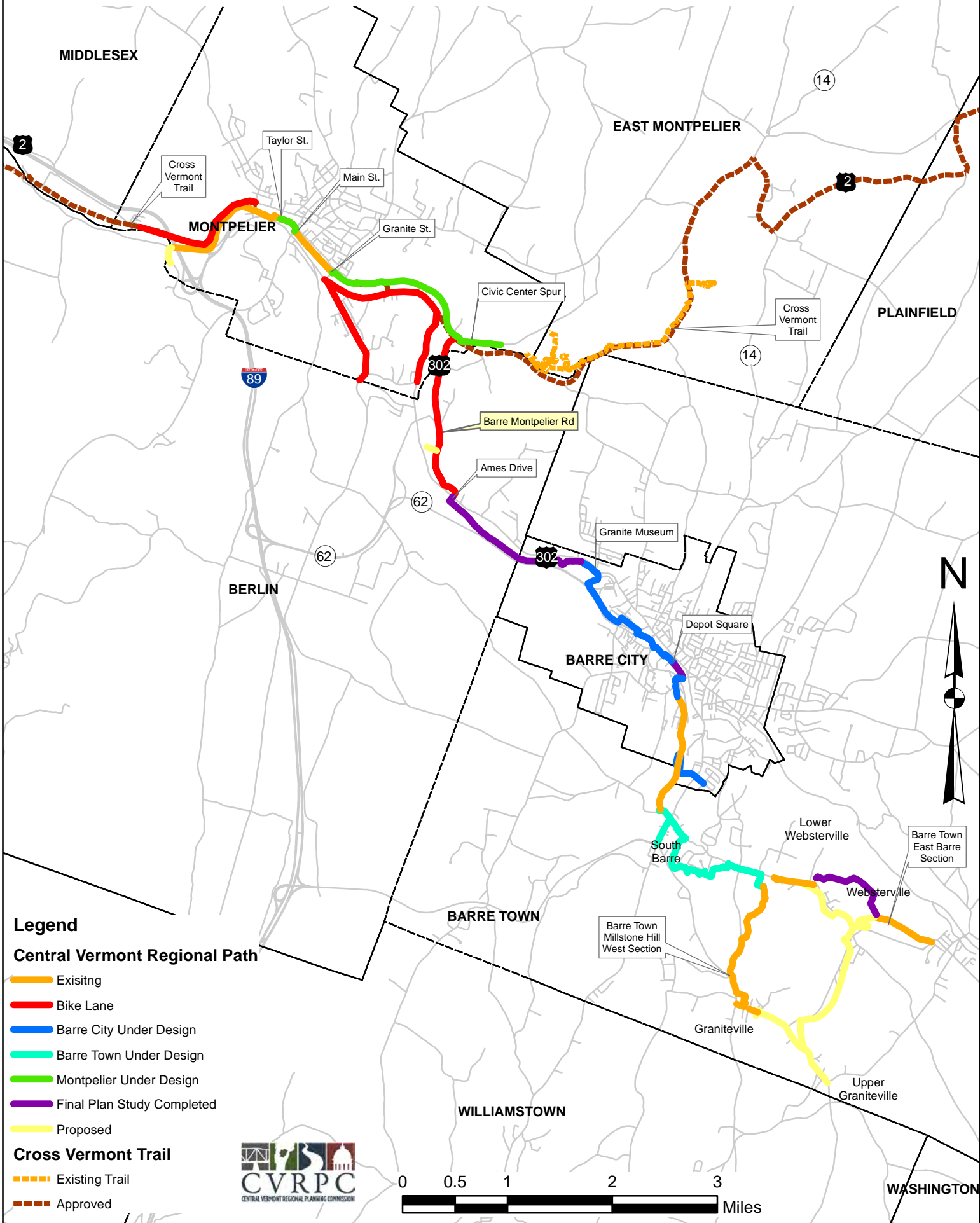
Respectfully submitted,

89

Janet E. Shatney, Planning Director

90

Central Vermont Regional Path Status - 03/20



Legend

Central Vermont Regional Path

- Existing
- Bike Lane
- Barre City Under Design
- Barre Town Under Design
- Montpelier Under Design
- Final Plan Study Completed
- Proposed

Cross Vermont Trail

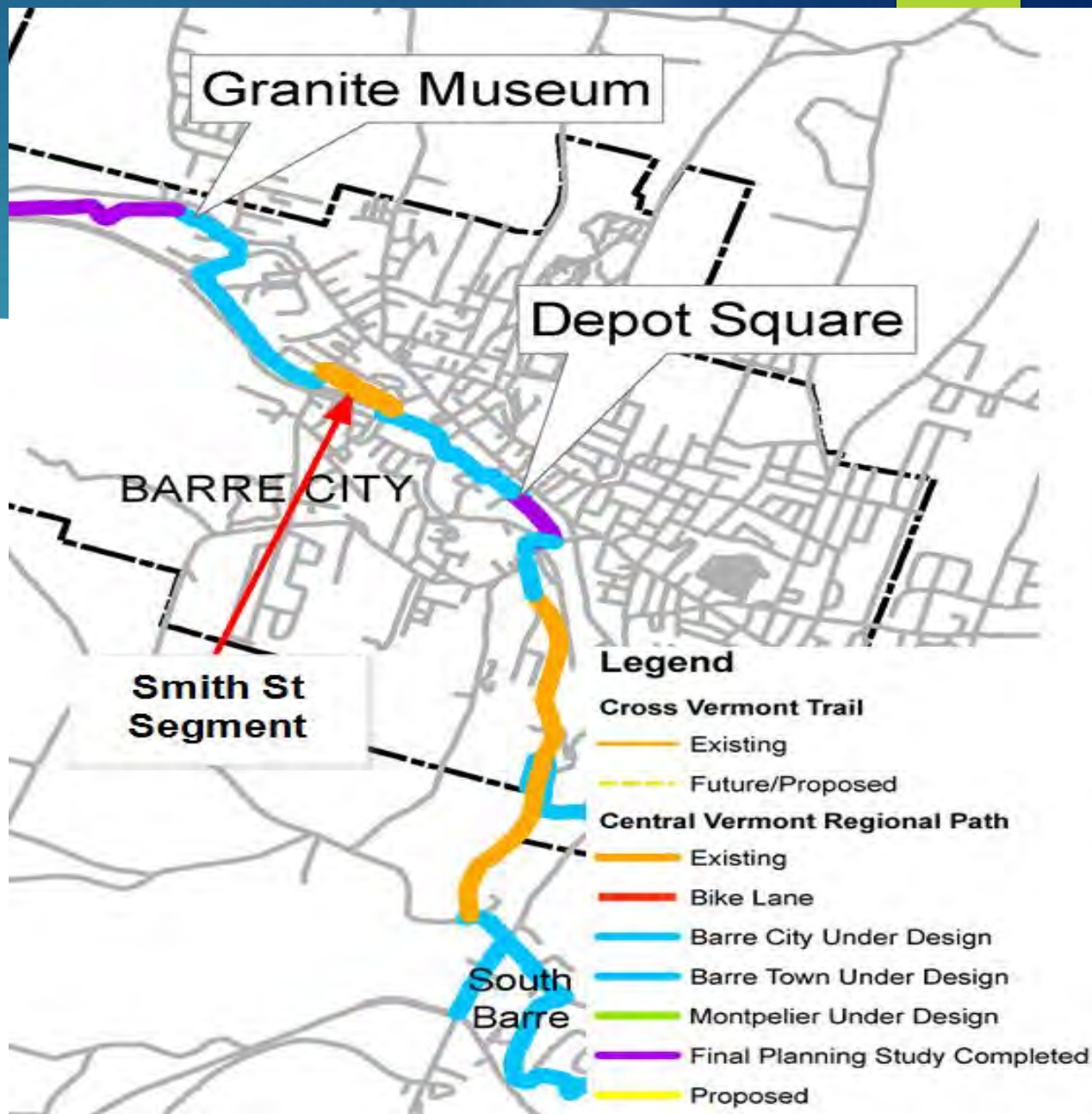
- Existing Trail
- Approved



Barre City Path Committee

DECEMBER 5, 2017 UPDATE

Smith St Extension Complete!





11/28/2017



11/28/2017



11/28/2017



11/28/2017



Segments Summary

As of December 2017

Segment	Priority	Status	Target or Actual Completion Date	Design Status	ROW Status	Act 250 Status	Pre-Construction Costs (Study, Design)	Estimated Construction Cost	Funded	Amount	FUNDING SOURCES		
											\$500K Semp Bequest	\$1.1M Semp Fund	TIF or Grant
Main Line Segments:													
Original (South-end) Path (Fairview St. to BCEMS to Bridge St)*	Done	COMPLETED	COMPLETED	COMPLETED	COMPLETED	n/a	COMPLETED	COMPLETED	n/a	n/a			
Enterprise Aly	Done	COMPLETED	October, 2015	COMPLETED	COMPLETED	n/a	COMPLETED	\$96,000	Yes	\$96,000			\$96,000
Smith Street	Done	COMPLETED	October, 2017	COMPLETED	COMPLETED	Approved	COMPLETED	\$500,000	Yes	\$250,000			\$250,000
Merchants Row (Metro Way)	1	Not Started	2019?	Not Started	Not started		\$20,000	\$150,000	Yes?			\$150,000	
Granite St. (Railyard) to Blackwell St.	2	Design Initiated	2020?	In Progress	Initiated - 5%	?	?	?	No			TBD	
Original (South-end) Path UPGRADE	3	Not Started	?	Not Started	n/a	n/a	?	?	No				
Route 302 (B-M Road) Bike Lanes (Berlin Street to Berlin Town Line)	Done	COMPLETED	October, 2017	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Museum Segment	4.a	Prelim'y Design Complete; Final Design Not Started	Unknown - Contingent Upon Design & Funding	Not Started	Not Started	?	Unknown	\$1.5 - \$2M +/-	No			TBD	
Route 302 (B-M Road) Bike Landes (Berlin Street to Berlin Town Line)													
Miscellaneous Segments:													
Richardson Road Connector	4.b ?	Scoping Study Authorized; Not Started	Unknown (Abandon Study?)	Contingent Upon Study	Not started	?	\$25,000	NS	Yes (Study)			\$25,000	
Connector Path (To Ayer Street?)	?		?		N/R				No				
Connector Path Spur	?		?		Initiated - 5%				No				

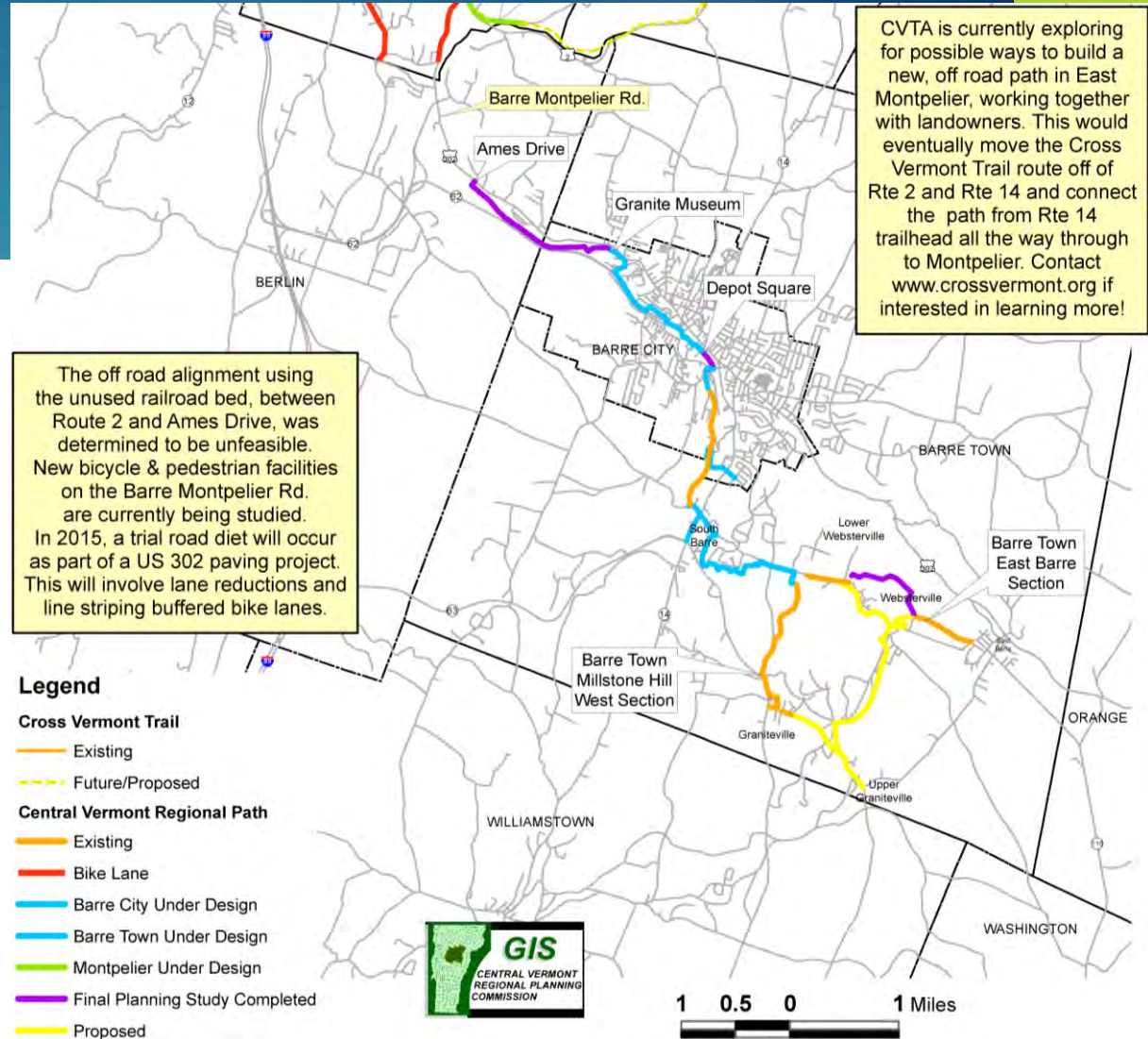
Green Indicates segment is constructed /completed

n/a = Not Applicable; N/R = Not Required

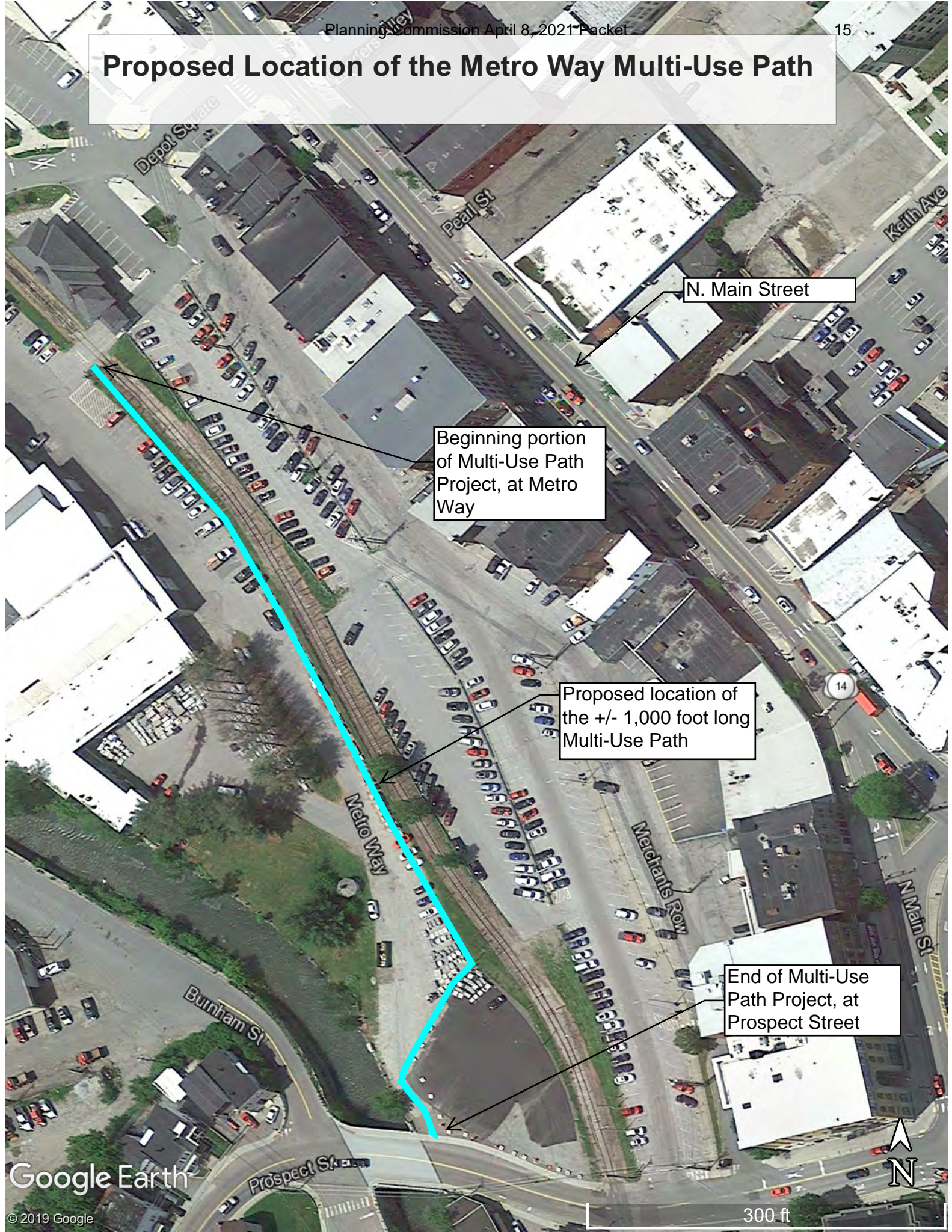
Bridge Street Terminus is in South Barre. Town is working on completing the missing links from Bridge Street to Barre Town Elementary School

Next steps

► Future considerations



Proposed Location of the Metro Way Multi-Use Path



N. Main Street

Beginning portion of Multi-Use Path Project, at Metro Way

Proposed location of the +/- 1,000 foot long Multi-Use Path

End of Multi-Use Path Project, at Prospect Street

River Street Pathway

Feasibility Study

Report
July 2019

This entire study was too large to attach to the packet. It can be forwarded separately upon request.

Prepared for:

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Prepared by:

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Introduction

This feasibility study considers alternatives that will connect two ends of existing shared use path within Barre City. The City has constructed one segment of pathway along Smith Street (Figure 2) and another along Enterprise Alley (Figure 3). These two ends will be connected via a pathway route along Blackwell Street, Center Street, River Street, and Granite Street, shown highlighted in red in Figure 1.

The design of this shared use path will aim to comply with the Vermont Agency of Transportation (VTrans) Pedestrian and Bicycle Facility Planning and Design Manual (referred to as the “VTrans Bike & Ped Manual”). Page 5-11 of the manual states that “shared use paths attract people of all ages, with capabilities ranging from slow-moving pedestrians to fast-moving bicyclists,” all of whom should be considered in shared use path planning and design. It also highlights characteristics of successful shared use paths that this study will consider, including but not limited to:

- Continuous separation from motor vehicle traffic
- Increased levels of safety and security
- Scenic qualities
- Well-designed street and driveway crossings
- Uniform design and good engineering
- Context sensitive design and aesthetics

Existing Conditions

Natural Resources

According to the Vermont Agency of Natural Resources (VANR), there are no wetlands within the project area. However, a significant amount of the proposed pathway route is within the 100-year floodplain of Stevens Branch of the Winooski River, as shown in Figure 4. Additionally, Figure 5 shows that River Street is in the floodway.

Figure 5 shows the hazardous sites, hazardous waste generators, and brownfields within the project area. There are two hazardous sites immediately adjacent to the northwest side of Granite Street.

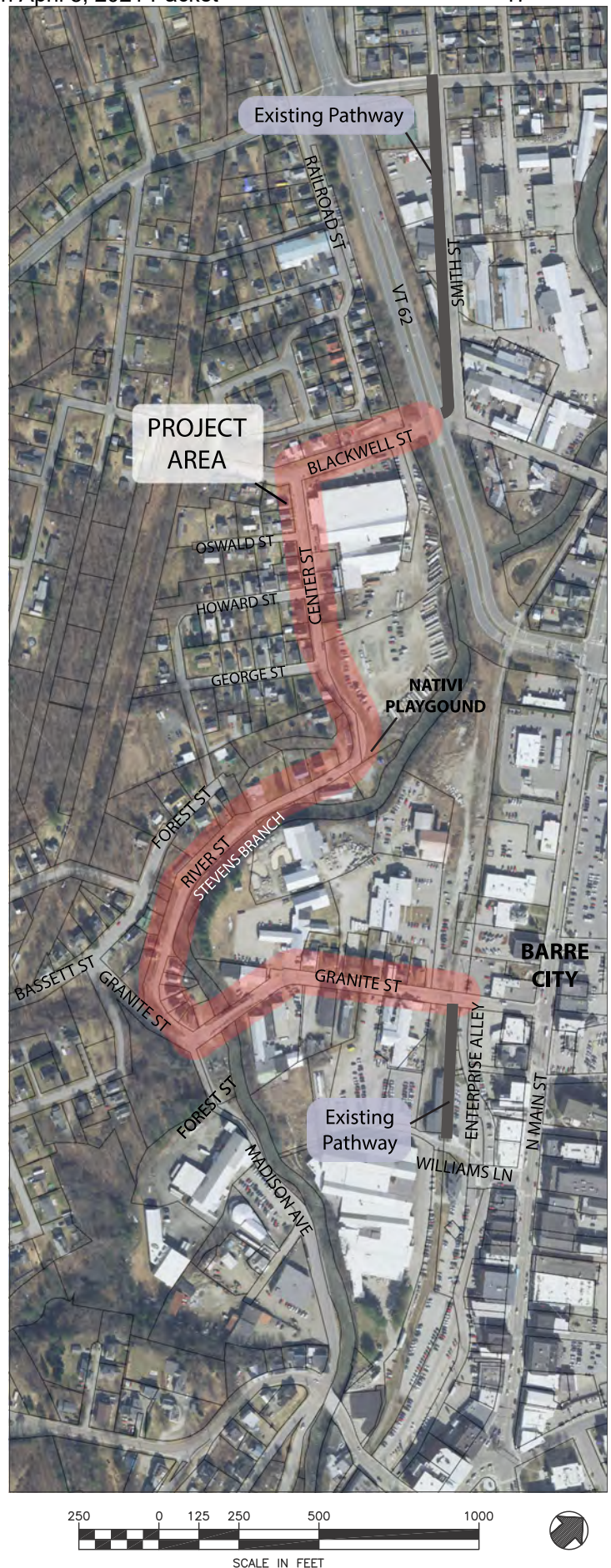


Figure 1. Project area

This is the first 12 pages of the City of Montpelier Montpelier-In-Motion full plan. Please see their website for the full version at:

<https://www.montpelier-vt.org/518/Montpelier-in-Motion>

The City of Montpelier

Montpelier in Motion



Submitted by:
Broadreach Planning & Design

In conjunction with
RSG Inc.

July 31, 2015

Montpelier in Motion is formatted for double-sided printing; blank pages are intentional.

Throughout *Montpelier in Motion*, the Steering Committee has used the terms "walkers" and "pedestrians" interchangeably, with a preference for the more descriptive "walker."



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FIGURES

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- Figure 1: Existing Conditions & Facilities**
- Figure 1a: Existing Conditions & Facilities Detail**
- Figure 2: Sidewalk Gaps**
- Figure 3: Walking Facilities**
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- Figure 5: Walking Improvements**
- Figure 5: Walking Improvements Detail**
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- Figure 7: Long-Term Bicycle Network**

APPENDICES

Appendices are located after the figures.

- Appendix A: Back-Up Data & Information**
- Appendix B: Partners List**
- Appendix C: Existing Condition Summary**
- Appendix D Alternatives Summary**
- Appendix E: Steering Committee Meeting & Public Work Session Notes**
- Appendix F: Street by Street Summary of Physical Improvements**
- Appendix G: East-West Bike Path Extension Plans**

I. INTRODUCTION

A. OVERVIEW

Montpelier in Motion is the pedestrian and bicycle plan for the City of Montpelier, Vermont. The City has developed this plan to serve as a guide for future actions to make bicycling and walking easier, more visible, and more widely undertaken by residents and employees. *Montpelier in Motion* (the Plan) provides an outline of how Montpelier can improve walking and bicycling within the City and make progress towards reaching the goals it has set for these activities. It includes a wide range of recommendations from physical improvements to policy updates that the City and its partners can pursue.



The Plan presents future actions, initiatives, and projects to improve walking and bicycling opportunities in the City, based on walking and bicycling goals that the City hopes to reach. **Section III** describes recommendations for physical changes to the City's infrastructure. **Sections IV, V, and VI** describe education, enforcement, encouragement and policy recommendations, as well as recommended additional studies. In addition, this Plan addresses ongoing maintenance of these facilities, as well as City policies regarding walking and bicycling; walking and bicycling education and encouragement activities; and local and state walking, bicycling, and driving law enforcement. It also suggests additional related studies that the City might want to explore. Finally, *Montpelier in Motion* contains methods of evaluating progress towards attaining the City's walking and bicycling goals.

The Plan presents over 35 separate recommendations for increasing bicycling and walking activity in Montpelier. They are options that the City can consider. Not all of them might ultimately be implemented. **Section VII** presents suggestions about which recommendations could be considered high priority, as well as others that could be near-term, mid-term, and reserve priorities for the City. Even though there are suggested priorities, most of the recommendations can be implemented independently; they are not sequential and do not require other recommendations to be implemented first. Consequently, the recommendations can be implemented in any order, if an opportunity arises or a "champion" steps forward to take the lead on implementing one of the recommendations.

The City already has a well-developed sidewalk system and the beginnings of a bicycling network. **Figures 1 and 1a** provide an overview of Montpelier's existing bicycle and pedestrian resources.

B. MONTPELIER'S WALKING & BICYCLING VISION & GOALS

Montpelier's vision for walking and bicycling is that:

Montpelier has safe, well used, convenient and accessible conditions for walkers and bicyclists of all ages and abilities. Bicycle, pedestrian and roadway networks provide mobility throughout the City and easy connections to other transportation modes, while complementing the City's natural environment, community character and overall quality of life. Montpelier's residents, government and businesses work continuously and collaboratively to make walking and bicycling around the City part of the daily lives of its residents and business people.

The Montpelier City Council has set a goal of becoming a recognized walking and bicycling city. The City Plan highlights another goal, to increase the number of Montpelier residents who commute by walking or bicycling by 40 percent by 2040. The Montpelier Bicycle Advisory Committee has established an additional goal of increasing the mileage of bike lanes and shared use paths by 20 percent by 2016, amounting to a little less than one mile of additional lanes or shared use paths.

As part of developing *Montpelier in Motion*, the Steering Committee identified several interim or additional goals. The numbering system for the goals is for convenience and identification only and does not imply any order of importance.

- 1) Increase the number of pedestrians by three percent every year.
- 2) Increase the number of bicycle commuters by five percent every year.
- 3) Undertake a minimum of nine walking improvement projects, including at least one new construction project, per year.
- 4) Connect the existing portions of the east-west shared use path by 2020.
- 5) Create a north-south bicycle route usable by bicyclists of all ages and abilities by 2025.
- 6) Undertake at least one bicycle improvement project per year.
- 7) Maintain the existing record of no walker or bicyclist deaths in a year's time.
- 8) Reduce the number of walker or bicyclist crashes annually until there are no crashes and then maintain a no-crash record.
- 9) Undertake walking and bicycling improvement projects while upholding the current steady state of maintenance for existing walking, bicycling and motoring facilities.

The City has numerous reasons for setting these goals. The benefits to residents, businesses, the environment, health, and the overall livability of the City when there is a strong bicycling and walking culture are well documented. **Appendix A** includes background information on this documentation.

C. PURPOSE & NEED OF THE PLAN

The purpose of the *Montpelier in Motion* plan is to serve as a guide for future bicycling and walking physical and non-physical improvements within the City. The City needs to responsibly allocate its limited resources and be responsive to the current State legislation of creating "complete streets" when appropriate that provide a means of appropriate transportation for people all ages and abilities. Having a walking and bicycling master plan will allow the City to include prudent improvements for walking and bicycling into its overall budget in the most efficient manner. The *2010 City of Montpelier Master Plan (2010 Master Plan)* includes support for creating a Bicycle and Pedestrian Master Plan. The City Council has recognized the well-documented improvements to the City's overall economy, environment, public health, and well-being that improved walking and bicycling conditions bring. Additional needs for, as well as benefits of, *Montpelier in Motion* are numerous. The following representative list is presented in no particular order.

- Increasing walking and bicycling as a means of transportation can reduce congestion in the downtown.
- Increasing walking and bicycling activities in cities has a very positive economic development effect for businesses.
- Knowing what type of walking and bicycling hazards exist and where they are located can help the City eliminate as many of them as possible.
- Prioritizing construction and repair for bicycling and walking activities is easier when there is a master plan.
- Serving as a planning tool in prioritization and budgeting of capital projects.
- Understanding where gaps in the current bicycling and walking networks helps the City address them faster.
- Walking and bicycling on a regular basis can improve the health of residents.
- Increasing non-motorized connections to popular destinations increases the likelihood that people will walk or bicycle there rather than drive a motor vehicle.
- Providing better bicycling and walking conditions expands transportation opportunities to a wider range of residents of all ages and abilities.
- Improving walking and bicycling conditions creates more livable cities.
- Enhancing the aesthetic experience of walking can increase the number of walkers.
- Walking and bicycling causes less deterioration of City infrastructure than driving motor vehicles.
- Encouraging walking and bicycling activities typically results in more walkers and bicyclists.

Appendix A includes background references or sources for many of these statements.

D. USE OF THE PLAN

Several of the physical improvements recommended in the Plan will need additional study, analysis, and/or design work before they can be implemented. The Plan notes in the individual recommendations when additional work is needed prior to implementation.

The recommendations in the Plan are based on current conditions but can still serve as a long-term guide for the City. Ideally, the City should review and renew *Montpelier in Motion* every five years or so, updating it as needed. With periodic updates, the Plan can continue to serve as a guide for the next 25 years or more.

The evaluation section near the end of the Plan is provided so that the City can track its progress towards meeting its goals. While increases in economic return as a result of greater walking and bicycling are well documented, they cannot be easily used as a means of tracking progress. **Appendix A** includes information on the economic return to businesses and cities and other benefits of improved bicycling and walking.

Several sections include prioritizations into high, medium and extended priorities. In general, high priorities are those that should ideally be addressed in the next five years; medium priorities are those that should ideally be addressed in the next five to ten years, if not sooner; and extended priorities are those that might take more than ten years to implement.

E. PARTNERS

The City's efforts to create a better walking and bicycling environment can be greatly expanded with the cooperation and help from other agencies, not-for-profit organizations, State Government and businesses. The report assumes that they will participate, and in many cases, lead in implementing the recommendations included in the Plan. Each of the recommendations is followed by a listing of the City departments or outside entities that would be best suited to lead or undertake implementation. **Appendix B** includes a complete list of the partners along with different recommendations that might be best for them.

F. DEVELOPMENT PROCESS & ORGANIZATION

This Plan was prepared by a Steering Committee consisting of representatives of Montpelier's Bicycle Advisory and Pedestrian Advisory Committees, its Public Works, Planning and Police Departments, the City Manager's office and interested citizens, aided by Broadreach Planning & Design and RSG (the BRPD Team).

Appendix C includes a summary of the existing bicycling- and walking-related conditions within the City that the Steering Committee compiled as it began

developing the Plan. After this introduction, **Section II** of the Plan contains a short summary of existing conditions. The Steering Committee held a public work session to gather public input on thoughts, suggestions or complaints about existing or future walking and bicycling conditions as part of their review of existing conditions.

Following completion of the Existing Conditions work, the Steering Committee held a work session in which they developed many ideas and alternatives for both physical changes to the City and new or updated non-physical actions that would enhance walking and bicycling in the City. After further analysis and refinement, the alternatives were distributed for public comment and the Steering Committee held a second public work session. **Appendix D** summarizes the various different options that the Steering Committee considered for inclusion in the final version of *Montpelier in Motion*. **Sections III, IV, V, and VI** of this Plan present the recommendations that emerged from this step in the project.

The Steering Committee presented the first draft of the final Plan at a work session and then allowed an extended assessment period to make sure that the City and others had time to fully review the contents of the first draft of the final Plan. **Appendix E** includes summaries of several Steering Committee meetings and the public work sessions they conducted as part of the preparation of this Plan.

Section VII of the Plan includes ideas on how its recommendations could be implemented. **Section VIII** presents methods for measuring progress towards attaining the goals the City has set for walking and bicycling.





YOUR PARKS, YOUR WINOOSKI

2020 PARKS & OPEN SPACE MASTER PLAN

A community-driven master plan

The city of Winooski Parks and Open Space master plan can be seen at their website at:

<https://www.winooskivt.gov/1460/Archived-Parks-and-Open-Space-Master-Pla>.
This excerpt is the first 3 pages of a 190-page plan.

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BURLINGTON PARKS, RECREATION & WATERFRONT MASTER PLAN

SUMMARY
OCTOBER 2015

This is the City of Burlington's Master plan summary.
Please see their website at:
<https://enjoyburlington.com/bprw-master-plan/>



BURLINGTON
**PARKS
RECREATION
WATERFRONT**
VERMONT

S A S A K I



BPRW 7 SYSTEM THEMES

The BPRW planning process resulted in the development of seven unique system themes that represent key areas of focus - upon which recommendations for the next 10 years are based.

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PEOPLE



WELLNESS



GROWING TOGETHER

66

BPRW aspires to build upon its legacy of providing outstanding recreational opportunities, partnerships, and environmental stewardship for the community. The department is poised to embrace and expand upon its new brand identity, integrating comprehensive and holistic approaches to recreation programming, operations and maintenance, capital planning, and marketing.

This commitment ensures BPRW's continued role in service to the community, further improving our incredible parks system. The BPRW Master Plan system themes and strategic initiatives provide clear direction and focus for the future of our parks that is drawn from community input, identified need, and stewardship of the environment. The result is the renaissance of our parks system, already tangible, teaming with impactful opportunities to benefit Burlington and beyond.

CONNECTION



STEWARDSHIP



COMMUNITY



SERVICE



IMPACT



BPRW MISSION

BPRW strives to connect diverse, dynamic public spaces and programs which grow, inspire and create inclusive social spaces through land, water and people.

BPRW VALUES

ACCESSIBILITY

Emphasis on universal design & financial sensitivity in all experiences.

INTEGRITY

Trust developed in doing our work in the public realm.

DEPENDABILITY

Service-oriented & responsive customer service.

HEALTH/WELLNESS

Focus on active, healthy & balanced lifestyles.

TEAMWORK/PARTNERSHIP

Commitment to collaboration and coordination with our community & colleagues.

INCLUSIVITY

Fostering cultures of all kinds.

STEWARDSHIP

Of public service & a sustainable environment.

QUALITY

In everything we do.

BPRW GROWTH VISION

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Foster a supportive & constructive environment that embraces equity through inclusive decision making and mindful daily actions.

IMPLEMENTATION GUIDELINES

1. The BPRW values and strategic recommendations become the guidepost for the entire department, intended to guide the department and the community over roughly the next 10 years (2015 to 2024).
2. Include the master plan as part of BPRW Commission member and employee orientation programs.
3. Post the plan's executive summary on the BPRW website and track results on the site.
4. Identify a primary staff person (or team) to be the "champion" of the plan's implementation to ensure success.
5. Identify secondary staff persons to be the "project leader" to manage actions associated with each specific recommendation.
6. Report on the plan's progress regularly.
7. At the end of the year, develop a written review, along with supporting documentation, of progress on the plan.
8. In addition to an annual review, a more comprehensive three year review will occur in FY18, FY21, FY24, etc.
9. Update major stakeholders on the plan's implementation and results on an annual basis.
10. Conduct staff meetings on a regular basis, such as semi-annually to review the plan's progress and results.
11. Complete an annual review of the upcoming year's recommendations to determine if any priorities have changed.
12. Post a chart of each year's recommendations with a check-off column designating completion as part of a visual management program.

BPRW STRATEGIC INITIATIVES

BPRW Strategic Initiatives

Recently Completed & Underway

- ✓ Create a City-wide ten year capital plan.
- ✓ Align dedicated parks capital with City capital priorities.
- ✓ Allocate dollars toward marketing to increase program/park attendance and awareness of BPRW.
- ✓ Replace and redesign website.
- ✓ Develop design standards for park elements including benches, trash receptacles and bike racks.
- ✓ Develop and implement new wayfinding & sign standards.
- ✓ Develop the Parks Foundation of Burlington to augment capital investment within the parks system.
- ✓ Develop park lighting standards.
- ✓ Staff reorganization: evaluate job descriptions, implement evaluations, investigate structures.
- ✓ Improve City-wide work order systems and continue to invest in public request-for-service-systems.
- ✓ Comprehensively assess and amend the City's park lot coverage policy.
- ✓ Create a standard for placement of new bench amenities and eliminate memorial bench policy.
- ✓ Continue to improve technology.
- ✓ Hire an Internal Events Coordinator to support special events.

Short-Term Recommendations (FY15-FY18)

- Identify areas to better accommodate departmental storage need.
- Develop an annual comprehensive marketing plan.
- Develop a regular review period that includes a cycle of reflection.
- Investigate the feasibility for the Parks Foundation to oversee a scholarship endowment.
- Develop mobile technology capacity through improved software and hardware investment.
- Develop maps to better showcase priority areas.
- Apply for CAPRA accreditation.
- Update the Urban Forestry Master Plan.
- Gain better understanding of stormwater & watershed opportunities through partnerships.
- Increase conservation education opportunities through the introduction/expansion of wayfinding.
- Develop policy on addition or elimination of assets.
- Work with DPW to identify a plan for the long term maintenance of park roadways.
- Identify & maintain an active inventory of open space for potential acquisition.
- Consider ways to increase funding in order to increase the amount of parks capital dollars.
- Implement preventative maintenance standards and programs for parks, beaches, trails, and facilities.
- Conduct a bike parking inventory and develop a strategy to ensure that every park has bike parking.

- Complete a comprehensive program evaluation.
- Increase offerings of special events based on community survey feedback.
- Strengthen programmatic accessibility.
- Facilitate focus groups to better understand recreation needs and how to best service those needs.
- Increase staffing for athletic programs.
- Implement significant recreation recommendations.
- Update the Harbor Management Plan.
- Conduct environmental studies of southern harbor in anticipation of future marina expansion.
- Make Lake Champlain water quality and stewardship a public priority.

Medium-Term Recommendations (FY19-22)

- Develop marketing and business plans for major facilities.
- Develop a plan for connectivity among facilities and parks.
- Develop a financial pro forma and public process for Memorial Auditorium building alternatives.
- Add BPRW amenity information to the NRPA PRORAGIS database.
- Complete the design and construction of the 8-mile Burlington Bike Path Rehabilitation.
- Consider outdoor winter recreation opportunities.
- Increase trail management and access.
- Evaluate existing dog parks and possibly develop an additional dog park in the southern end of the City.
- Prioritize new assets based on community survey and LOS standards.
- Update Management Plans for Urban Wilds.
- Perform an accessibility inventory of the parks system.
- Increase park maintenance staff.
- Encouraging buffer/natural zones, tying into community desire for more passive recreation areas.
- Develop a list of current assets to re-imagine or remove based on community survey & LOS standards.
- Create a regional recreation roundtable to discuss partnership opportunities.
- Dedicate recreation labor resources to new supporting positions.
- Initiate a community out-of-school resource mapping exercise.
- Improve & increase capacity at revenue and tourism centers.
- Work with CEDO to develop a tourism plan for BPRW services and events.

Long-Term Recommendations (FY23 & Beyond)

- Add an internal staff position to oversee BPRW's use of technology as well as overseeing data analytics.
- Analysis & redesign of Battery Park to clarify historical significance and improve aesthetics & function.
- Identify more community indoor, multi-use recreation space.
- Evaluate North Beach Campground & Marina for new and innovative uses.



Pedestrian Environmental Quality Index (P.E.Q.I.)

The PEQI is a quantitative observational tool that was originally developed in 2008 by the [San Francisco Department of Public Health](#) to assess the quality and safety of the physical pedestrian environment and inform pedestrian planning needs. Beyond assisting planning, PEQI campaigns can help build social capital and political visibility for neighborhoods and communities. The PEQI has two survey forms and gathers data in six categories: intersection safety, traffic, street design, land use, perceived safety and perceived walkability.

Since the urban fabric of San Francisco differs greatly from Los Angeles, UCLA COEH needed to adapt the original PEQI to better fit Los Angeles street conditions. The survey has also been translated into Spanish. To date, UCLA has implemented the PEQI with four Los Angeles community groups. Two of these groups have already lobbied for and received the safety improvements they sought; the other two groups are currently creating their advocacy campaigns using the findings from their PEQI data. See below for a summary of our work with an East Los Angeles community group, Proyecto Pastoral.

The **paper version** offers a low-tech option to the smart phone application. Everything needed to implement the **paper version** of the PEQI is below.

- [1. PEQI Full Protocol UCLA v2 \(pdf\)](#)
- [2. Training Slides in English](#)
- [2. Training Slides in Spanish](#)
- [3. Intersection Form in English \(pdf\)](#)
- [3. Intersection Form in Spanish \(pdf\)](#)
- [4. Segment Form in English \(pdf\)](#)
- [4. Segment Form in Spanish \(pdf\)](#)
- [5. Intersection Form Coder's Version \(pdf\)](#)
- [6. Segment Form Coder's Version \(pdf\)](#)
- [7. Data Entry Spreadsheet with examples](#)
- [8. Intersection Training Quiz](#)
- [8. Intersection Training Quiz](#)
- [9. Cheatsheet Field Guide in English](#)
- [9. Cheatsheet Field Guide in Spanish](#)

The PEQI website can be found at:
<http://www.peqiwalkability.appspot.com>

Please direct any questions about the UCLA PEQI to:

Christina Batteate cbatteate@ucla.edu

Photo credits: Christina Batteate and Elina Nasser

WALKABILITY & PEDESTRIAN SAFETY IN BOYLE HEIGHTS

Using the Pedestrian Environmental Quality Index (PEQI)

History of Camino Seguro

In February 1999, residents of the Pico-Aliso community in Boyle Heights joined together with Proyecto Pastoral to create Camino Seguro (“Safe-Passage” in Spanish) to protect the safety of their children. Camino Seguro arose to combat the gang-violence crisis in Boyle Heights. People were afraid to go out on the street as shootings victimized adults, youth and children alike. The community came together to stand at street corners, schools and churches, held Peace Walks, met with elected officials and law enforcement asking for a response to the crisis. Today, gang-violence has subsided in Boyle Heights but residents are aware that if they don’t maintain their efforts, violence can break out again. Camino Seguro has evolved with the community and in addition to providing escorts to children



Piloting the PEQI with community-members

WALKABILITY

Using the Pedestrian Environmental Quality Index (PEQI) for walkability and pedestrian safety in Boyle Heights

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on their way to school and to cross dangerous streets, the program has expanded to address issues of environmental health, youth drug and alcohol abuse, preventing gang-activity and relieving post-traumatic stress from living with the many years of violence.

Community-Based Participatory Research

In 2009 Proyecto Pastoral teamed up with UCLA's Center for Occupational and Environmental Health (UCLA COEH) with support from The California Endowment to create the academic-community partnership ACCION. This partnership allowed UCLA COEH to fulfill its mandate to provide technical assistance to Los Angeles-area communities and offered Proyecto Pastoral the opportunity to develop their capacity to organize for positive environmental change in their service area.

At the outset of the partnership, focus groups determined that pedestrian safety and walkability were a priority for Proyecto Pastoral members. Walkability is a term used to describe how well a neighborhood lends itself to walking as a means of transportation for residents. It is often expressed as a function of sidewalk and roadway design and presence of pedestrian amenities such as crosswalks, lights and signs. Walkability is an important factor of the built environment that can have long-term impacts on health depending on its presence or absence. Walkable communities promote physical activity and lower-risk for obesity and other chronic diseases and also confer protection to pedestrians from physical harm.

Camino Seguro members' perceptions about the poor pedestrian safety and walkability condi-



Community members collecting PEQI data

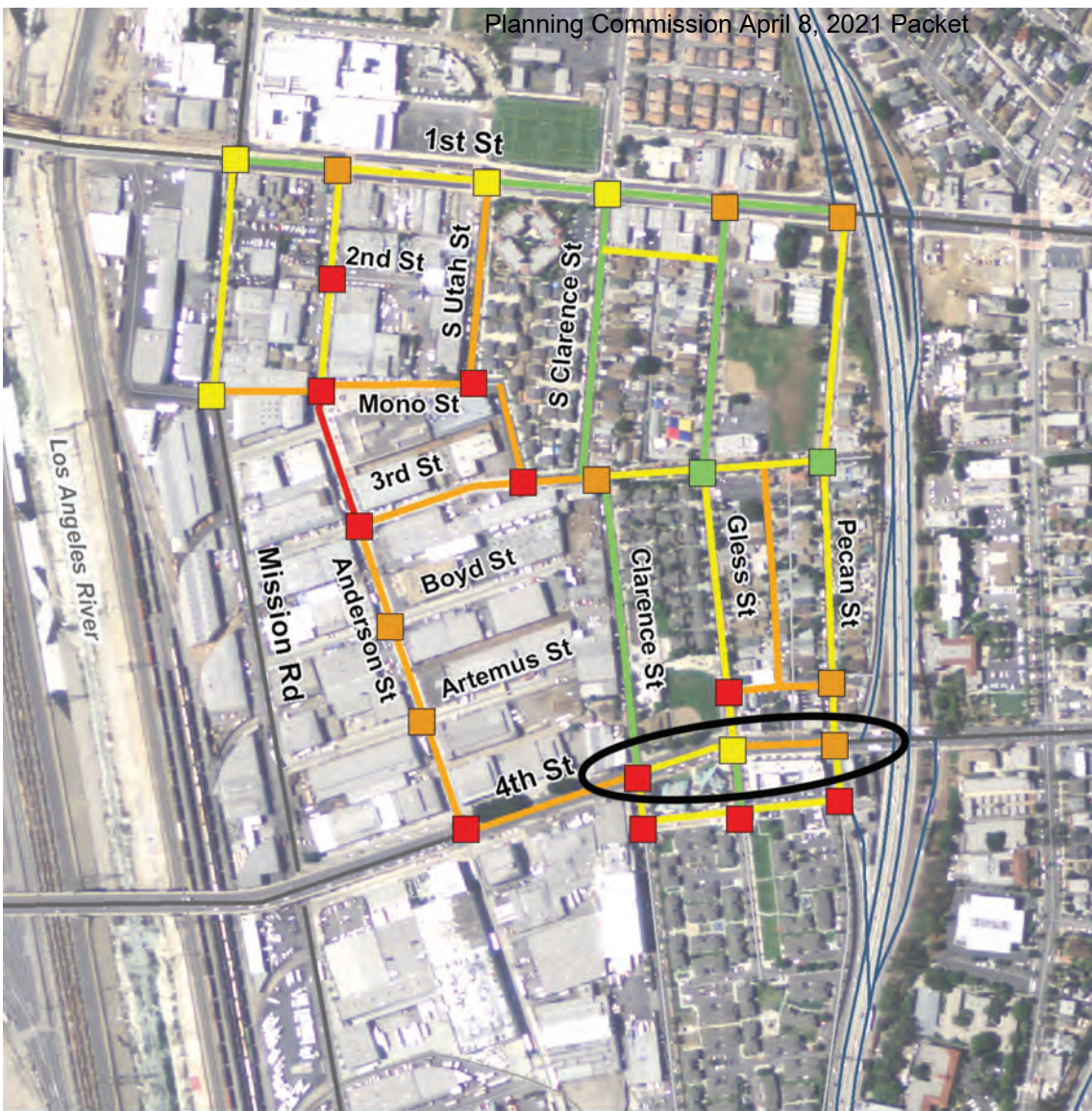
tions in their neighborhood were supported by statistical data collected by UCLA COEH. Boyle Heights' (10%) exceeds the Los Angeles City average (7%) for percent of collisions that involved pedestrians. Seventy-five percent of those collisions occurred in the daytime and thirty-nine percent injured a child or minor under 19 years of age. Furthermore, the intersection at 4th St and Gless St, identified by members as very dangerous, was found to be the third most dangerous intersection in Boyle Heights.

To assist Camino Seguro in addressing walkability, UCLA COEH introduced and trained the members in how to implement the Pedestrian Environmental Quality Index (PEQI). The PEQI is a quantitative observational tool that allows users to assess pedestrian safety and needs, prioritize planning for future improvements and build social capital. The PEQI has distinct survey forms for intersections and street segments and gathers data in six categories: intersection safety, traffic, street design, land use, perceived safety and perceived walkability. All categories evaluated in the PEQI are based in current scientific research and have been reviewed by international experts on walkability. UCLA COEH adapted this tool specifically for use in Boyle Heights.

To implement the PEQI involved a time-consuming process and strong commitment from Camino Seguro members. Members chose the geographic area to be evaluated (see Figure 1). Members then were trained how to collect data using the survey forms. Following the

Collision Statistics	LA City	Boyle Heights
Total collisions	364,029	5,600
Pedestrian/vehicle collisions	25,565	562
% of pedestrians in collisions	7%	10%
# pedestrians in collisions	28,724	634
# pedestrians per collision	1.12	1.13
Pedestrian fatalities	664	12

Source: Los Angeles Department of Transportation 1994-2000



PEQI Intersection and Street Scores



Data Source: Census TIGER Data (2010), Proyecto Pastoral (2011)
 Academic and Community Collaborative to Improve Our Neighborhood (ACCION) / Doug Houston, UC Irvine

Figure 1 **Proyecto Pastoral PEQI results with priority area for improvement circled in black**

trainings, members took to the streets filling out surveys until their area was covered. Once the street surveys were complete, UCLA COEH calculated the street and intersection scores. Each category in the PEQI receives weighted scores based on their contribution to pedestrian safety and walkability. The final scores of the streets and are reflected in Figure 1.

The Path Forward

Once all the PEQI results were in, UCLA COEH and Proyecto members met to discuss the data and to decide where to focus initial improvements. Members were encouraged that the scientific data reflected their perceptions of problem areas and were proud to see their hard work validated in the maps. Using members on-the-ground experience,

Categories evaluated by the PEQI

Intersection Safety

- Crosswalks
- Countdown Signal
- Traffic Signal
- Crossing Speed
- No Turn on Red
- Traffic Calming Features
- Pedestrian Signs

Traffic

- Number of Lanes
- Two-Way Traffic
- Vehicle Speed
- Traffic Volume
- Traffic Calming Feature

Street Design

- Sidewalk Width
- Sidewalk surface
- Sidewalk obstructions
- Presence of Curb
- Driveway Cuts
- Trees, Gardens
- Public Seating
- Buffers

Perceived Safety

- Illegal Graffiti
- Litter
- Pedestrian-Scale Light
- Construction Sites
- Abandoned Buildings

Land Use

- Public Art
- Historic Site
- Retail

Perceived Walkability

- Visual Attractiveness
- Feeling of Safety
- Smells
- Noise
- Overall Walkability



Community members reviewing pedestrian statistics maps

Proyecto Pastoral member recommendations for improvement on 4th Street segment

1. Lights embedded in the crosswalk for increased pedestrian visibility
2. Installation of a crosswalk mid-block at 4th Street and Clarence street
3. Give more time to cross at crosswalk at 4th Street and Gless street
4. Enforce speed limit at 25 mph

UCLA COEH research and the community-collected PEQI results, members decided that 4th Street between the 101 freeway and Clarence street were in the most dire need of immediate improvement (see black circle in Figure 1). Through a consensus building and voting process members decided on the design recommendations in the chart below to make the 4th St segment safer for pedestrians.

Due to nearby Dolores Mission Church, School and Youth Technology Center an ideal means of funding these improvements is through collaboration with the local City Council District 14 office and Safe Routes to School funding. While Proyecto Pastoral will take the lead in applying for the Safe Routes to School funds, they recognize that longer-term changes will need to occur in their area to improve safety. Longer term change will focus on cleaning up the area's alleyways that are hot-spots for gang-activity and advocating for land use policy change that would mitigate pollution from industrial uses adjacent to homes and schools. With the continued commitment of Camino Seguro members, Boyle Heights is on its way to achieving a more healthy and safe environment for all.

This work was made possible by:



For more information visit www.coeh.ucla.edu or www.proyectopastoral.org

Pedestrian Environmental Quality Index: Los Angeles Toolkit for Implementation

PEQI Full Protocol UCLA v2 Table of Contents

Glossary of key terms	This lists the terminology used in the PEQI assessment and training, along with definitions.	Pg 2-5
Data collection protocol	This explains how to use the PEQI instrument in a new study area. It includes a complete step-by-step description of how to scope and plan a new project.	Pg 5-13
PEQI data collection Intersection Form	This is the form used to actually perform data collection. (available in English & Spanish and should be downloaded individually from the website below)	Pg 14
PEQI data collection Segment Form	Same as above	Pg 15-17
PEQI Intersection form—coder’s versions	These versions of the forms include the numeric values that are entered during data entry. They are a guide for the person performing data entry.	Pg 18
PEQI Segment form—coder’s versions	Same as above	Pg 19-21
Formulas to calculate PEQI scores	This lists the formulas we have used to calculate the PEQI index. It also includes the weights you need to calculate the scores.	Pg 22-26
PEQI sample Min and Max scores	These show you how to get the Minimum and Maximum scores to be used to calculate final scores. If you do not modify the PEQI in any way you can use these Min and Max scores as your own.	Pg 27-33

Additional Items Needed for the PEQI

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

Data entry sheet	This MS Excel spreadsheet can be used to enter data from a PEQI data collection, so it can be analyzed.	see website
Training slides	This PowerPoint presentation can be used to train new PEQI data collection volunteers. (English & Spanish)	see website
Illustrated Guide —“Cheat sheet”	This handout is useful during the training and for users while collecting data. (English & Spanish)	see website
Training Quizzes	These PowerPoint Intersection & Segment quizzes can help to refresh or reinforce your trainings.	see website
Original S.F. PEQI training guide & documentation	Document originally produced by the San Francisco Dept of Public Health to accompany the original PEQI.	See website
S.F. PEQI Summary	This is a brief description of the PEQI, from the San Francisco Department of Public Health, that can be useful for outreach.	See website

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 highlight 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).
perceived walkability	Your overall impression of how much the physical environment supports and encourages walking on this street segment.

permanent sidewalk 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 precedence, 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 sidewalk 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 driver awareness, 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 the PEQI instrument in a new study area. It includes a complete step-by-step description of how to scope and plan a new project.

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.

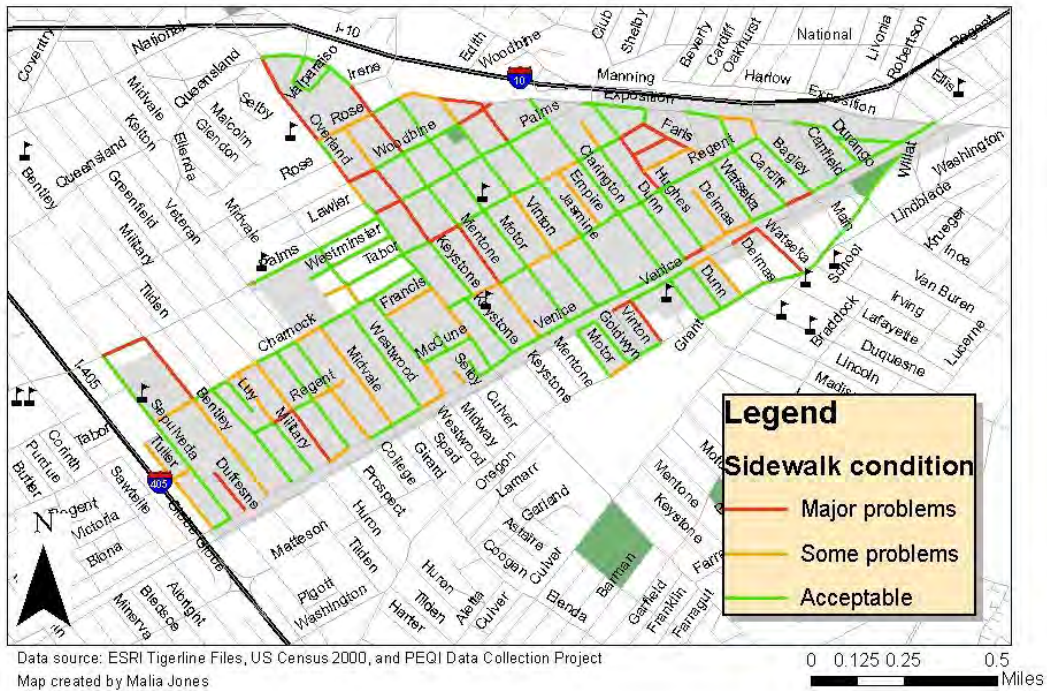
Data about walkability can be used to identify priority areas for improving the walkability of an area. Either the individual data elements or the index, or both together, can be used to show what elements and what specific streets/intersections need the most help.

The PEQI is designed to be collected by volunteer data collectors. This toolkit 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.

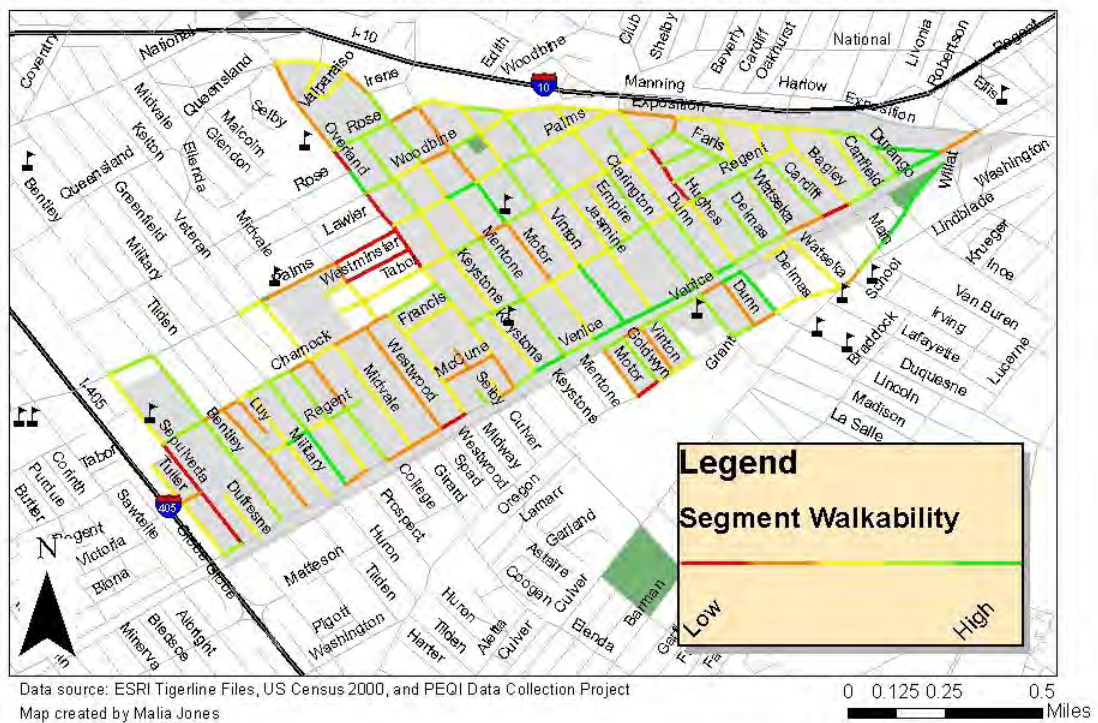
PEQI was developed in 2008 by the San Francisco Department of Public Health. The original survey instrument and materials about its development are available at their website: http://www.sfphes.org/HIA_Tools_PEQI.htm

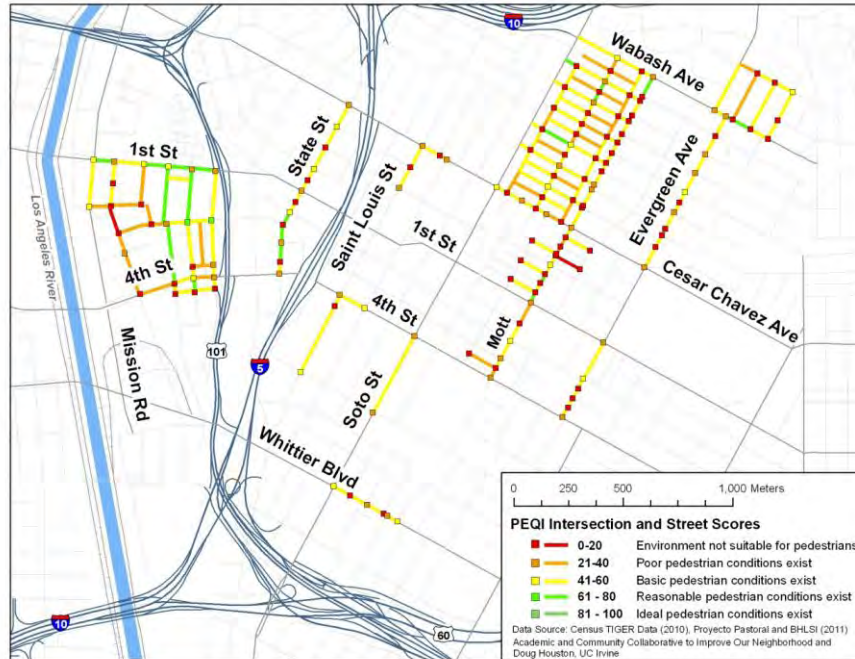
The PEQI was modified for use in Los Angeles by Malia Jones, MPH. Key changes were made to the original instrument in order to make it applicable to the Los Angeles Environment.

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.

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

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

What is unique to my area?

In this step, talk with your stakeholders to learn what walkability means to them in your study area. Are there specific problems they are concerned about? For example, in a recent project in Carson, CA, residents were concerned about whether pedestrians had enough time to cross wide streets.

Read through the PEQI forms to see if these important areas are captured. If they are not, you may want to modify the form to include new elements. Ask additional questions of your volunteers. For example, in Boyle Heights, we asked volunteers to note the number of idling trucks they passed as they walked down each block. Each new question should ask about **ONLY ONE** thing—don't bunch multiple ideas into one question. It should have specific, well-defined answers printed on the form to make it as simple as possible for your data collectors to answer. It's well worth pilot testing your new questions on a few people to make sure they are easy to understand and answer.

Don't add too many items or your data collectors will get tired and be unable to finish.

We do not recommend deleting items. This could lead to a situation where you can't use the formulas for calculating the indexes because you did not collect some parts of the formulas.

Step 3. Planning the data collection

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

Logistics

You will need to print enough PEQI forms to have one for every intersection and segment in your study. The PEQI form is divided into two parts. There is one part for each intersection and a second part for each street segment. The segment form can be completed once for *each side* of the street *OR* once for the *worse side* of the segment. We recommend that you print the forms on different colored paper to help your volunteers keep them separated. Note that you will need twice as many street segment forms as you have street segments, if you choose to evaluate *both sides* of the segment.

In addition to forms, each team will also need:

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

Training takes two hours. Data collection usually takes between 2-4 hours for each ½ 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 extremely important that your data collectors accurately identify the street segment or intersection they are assessing on each and every form they fill out. In fact this is the most important thing they will do. If they don't identify them well, you'll get a pile of forms back that cannot be attached to individual streets. This is useless.

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 included PowerPoint presentation 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. 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. 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.

If you have made modifications to the PEQI survey form, you will need to add these to the training slides. Explain exactly how you want your data collectors to handle your new items.

For training, you will need:

- A projector and computer to run the presentation
- Practice PEQI forms (1 per person)
- Pencils, 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.

Step 5. Collecting Data

After your volunteers have been trained, assign them to teams and give them their materials—forms, 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. Data entry and cleaning

Now that you have the data about walkability, enter it into an MS Excel spreadsheet so you can use it. The included data entry sheet can be used for this purpose. There is one tab for each of the two kinds of forms. Within each tab, there is one row for each intersection or side of each street segment. An example has been provided at the top of each form, which shows how we set up the scoring sheets and calculated the weighted values and final scores.

The person doing your data entry should use the “coder’s version” forms to understand how to convert the checks and boxes to numeric data.

If you have modified the PEQI forms you will need to modify this sheet and give your data entry person instructions about how to code the responses, turning them from checkboxes to numeric data.

Step 7. Data analysis and mapping

First, your data analyst should condense your data so that there is only one row per intersection and one row per street segment. Because you have separate information on the two sides of each street segment, you need to consolidate these rows to create an overall score for each street segment. You may also find that two or more teams surveyed the same parts of the neighborhood, resulting in having more than one record for each street/intersection. You should use the average (or mean) value for each item between the two sides of the street segment.

Now that your data are entered, you can look at them in aggregate or individually.

To calculate overall PEQI scores for each segment and intersection in your study area, first create weighted items according to the weights listed on the formula sheet included in the toolkit. Then add the items according to the formulas.

You can sort the data from lowest to highest to see what streets perform the worst on specific elements or overall. You can adjust the weights on the items that go into the PEQI score to emphasize the concerns of your community.

An expert in GIS software can help you show your results on a map by attaching the individual data elements or the index scores to the map. You may also use an image editing software, like Adobe Photoshop, to draw in lines on a map over the streets with colors reflecting each intersection and segments’ final score.

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 <i>(sample only- download original form from website)</i>																											
Team (names): _____				Date: _____																							
Intersection ID: _____																											
This is the intersection of : _____ and _____ <div style="display: flex; justify-content: space-around; width: 100%;"> Street 1 Street 2 </div>																											
		0 directions	1 directions	2 directions	3 directions	4+ directions																					
1. Crosswalks																											
2. Ladder crosswalks																											
3. Pedestrian signals	a. WITH countdowns																										
	b. NO countdowns																										
4. Stop signs																											
5. No Turn On Red signals/signs																											
6. Curb cuts at pedestrian crossings																											
7. Signal at intersection		<input type="checkbox"/> yes <input type="checkbox"/> no → if no, skip to item 8																									
<p>Cross street <u>ONLY</u> with a green light or walk signal. Measure across larger street.</p> <p>a. Crossing time: Measure crossing time (in seconds): _____ seconds</p> <p>b. Crossing distance: Measure crossing distance (in paces): _____ paces</p> <p>Length of my stride: _____ feet in my stride</p>																											
8. Crosswalk scramble		<input type="checkbox"/> yes <input type="checkbox"/> no																									
9. Intersection Traffic Calming Features <i>Indicate if any of the following are present</i>		<table border="0"> <tr> <td style="text-align: right;">Yes</td> <td>No</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> pavement treatments</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> median or middle-divider</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> mini-circles or roundabouts</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> speed tables, speed humps or speed bumps</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> bike lane at intersection</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> partial closures</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> drains, dips or other unintentional features that slow traffic</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> curb extensions/bulb-outs</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> lights set in crosswalk</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> other (explain: _____)</td> </tr> </table>				Yes	No	<input type="checkbox"/>	<input type="checkbox"/> pavement treatments	<input type="checkbox"/>	<input type="checkbox"/> median or middle-divider	<input type="checkbox"/>	<input type="checkbox"/> mini-circles or roundabouts	<input type="checkbox"/>	<input type="checkbox"/> speed tables, speed humps or speed bumps	<input type="checkbox"/>	<input type="checkbox"/> bike lane at intersection	<input type="checkbox"/>	<input type="checkbox"/> partial closures	<input type="checkbox"/>	<input type="checkbox"/> drains, dips or other unintentional features that slow traffic	<input type="checkbox"/>	<input type="checkbox"/> curb extensions/bulb-outs	<input type="checkbox"/>	<input type="checkbox"/> lights set in crosswalk	<input type="checkbox"/>	<input type="checkbox"/> other (explain: _____)
Yes	No																										
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<input type="checkbox"/>	<input type="checkbox"/> curb extensions/bulb-outs																										
<input type="checkbox"/>	<input type="checkbox"/> lights set in crosswalk																										
<input type="checkbox"/>	<input type="checkbox"/> other (explain: _____)																										
10. Additional signs for pedestrians		<input type="checkbox"/> yes <input type="checkbox"/> no																									

PEQI: Segment Form *(sample only- download original form from website)*

Team (names): _____ Date: _____

Segment ID: _____

This street is _____
Name of this street

Between: _____ and _____
Cross Street 1 Cross Street 2

Vehicle Traffic

11. Number of lanes <i>Do not include turn only lanes</i>	<input type="checkbox"/> 4 or more lanes <input type="checkbox"/> 3 lanes <input type="checkbox"/> 2 lanes <input type="checkbox"/> 1 lane <input type="checkbox"/> no lanes
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12. Two-way traffic	<input type="checkbox"/> yes <input type="checkbox"/> no
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13. Vehicle Speed / Posted Speed Limit	<input type="checkbox"/> not posted	<input type="checkbox"/> 10 mph <input type="checkbox"/> 15 mph <input type="checkbox"/> 20 mph <input type="checkbox"/> 25 mph <input type="checkbox"/> 30 mph	<input type="checkbox"/> 35 mph <input type="checkbox"/> 40 mph <input type="checkbox"/> 45 mph <input type="checkbox"/> 50 mph <input type="checkbox"/> 55+ mph
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14. Street Traffic Calming Features <i>Indicate if any of the following are present</i>	<table border="0"> <tr> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>street median</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>speed tables, speed humps or speed bumps</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>drains, dips or other unintentional features that slow traffic</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>chicanes</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>rumble strips</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>speed limit enforcements</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>other (explain: _____)</td> </tr> </table>	Yes	No		<input type="checkbox"/>	<input type="checkbox"/>	street median	<input type="checkbox"/>	<input type="checkbox"/>	speed tables, speed humps or speed bumps	<input type="checkbox"/>	<input type="checkbox"/>	drains, dips or other unintentional features that slow traffic	<input type="checkbox"/>	<input type="checkbox"/>	chicanes	<input type="checkbox"/>	<input type="checkbox"/>	rumble strips	<input type="checkbox"/>	<input type="checkbox"/>	speed limit enforcements	<input type="checkbox"/>		other (explain: _____)
Yes	No																								
<input type="checkbox"/>	<input type="checkbox"/>	street median																							
<input type="checkbox"/>	<input type="checkbox"/>	speed tables, speed humps or speed bumps																							
<input type="checkbox"/>	<input type="checkbox"/>	drains, dips or other unintentional features that slow traffic																							
<input type="checkbox"/>	<input type="checkbox"/>	chicanes																							
<input type="checkbox"/>	<input type="checkbox"/>	rumble strips																							
<input type="checkbox"/>	<input type="checkbox"/>	speed limit enforcements																							
<input type="checkbox"/>		other (explain: _____)																							

Sidewalks

15. Width of sidewalk	<input type="checkbox"/> no sidewalk <input type="checkbox"/> less than 5 feet <input type="checkbox"/> 5 feet – 7 feet 11 inches <input type="checkbox"/> 8 feet – 11 feet 11 inches <input type="checkbox"/> 12 feet or more
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<p>16. Sidewalk <u>surface</u> condition-- <i>An impediment is anything which poses a tripping hazard or interrupts the smooth surface of the sidewalk.</i> <i>Choose only one option from the right</i></p>	<p><input type="checkbox"/> no sidewalk <input type="checkbox"/> significant impediments in surface <input type="checkbox"/> few impediments in surface <input type="checkbox"/> no impediments in surface</p>
<p>17. Large sidewalk <u>obstructions</u> <i>An obstruction is any object which reduces the width of the sidewalk or hangs low so that people must duck to pass under while on the sidewalk.</i> <i>Choose only one option from the right.</i></p>	<p><input type="checkbox"/> no sidewalk <input type="checkbox"/> permanent obstructions <input type="checkbox"/> temporary obstructions <input type="checkbox"/> both permanent and temporary obstructions <input type="checkbox"/> no obstructions</p>
<p>18. Presence of curb</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
<p>19. Driveway cuts <i>how many present</i></p>	<p>_____ driveway cuts</p>
<p>20. Trees <i>Choose the one that best describes this street</i></p>	<p><input type="checkbox"/> continuously lined <input type="checkbox"/> a few trees; sporadically lined <input type="checkbox"/> no trees</p>
<p>21. Planters/gardens <i>public and private</i></p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
<p>22. Public seating <i>including bus stops</i></p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
<p>23. Presence of buffers <i>Indicate if any of the following are present</i></p>	<p>Yes No <input type="checkbox"/> <input type="checkbox"/> bike lane <input type="checkbox"/> <input type="checkbox"/> parallel street parking—not time-restricted <input type="checkbox"/> <input type="checkbox"/> parallel street parking—time-restricted <input type="checkbox"/> <input type="checkbox"/> grassy or paved margin</p>
<p>Land Use</p>	
<p>24. Storefront/retail use <i>Count the number of stores</i></p>	<p>_____ shops or businesses of any type</p>
<p>25. Public art/historical sites</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
<p>Safety and aesthetic qualities</p>	
<p>26. Illegal graffiti</p>	<p><input type="checkbox"/> Major graffiti <input type="checkbox"/> Little or no graffiti</p>
<p>27. Litter</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

Pedestrian Environmental Quality Index (PEQI)—**CODER'S VERSION**

Neighborhood: _____		Team Number: _____		Date: _____		
Intersection Form						
Intersection ID: _____						
This is the intersection of: _____ and _____ <div style="display: flex; justify-content: space-around; width: 100%;"> Street 1 Street 2 </div>						
		0 directions	1 directions	2 directions	3 directions	4+ directions
1. Crosswalks		0	1	2	3	4
2. Ladder crosswalks		0	1	2	3	4
3. Pedestrian signals	a. WITH countdowns	0	1	2	3	4
	b. NO countdowns	0	1	2	3	4
4. Stop signs		0	1	2	3	4
5. No Turn On Red signals/signs		0	1	2	3	4
6. Curb cuts at pedestrian crossings		0	1	2	3	4
7a. Signal at intersection		<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no → if no, skip to item 8				
See weights and measures sheet for how to calculate 7b, 7c and 7d.	Cross street ONLY with a green light or walk signal. Measure across larger street.	7b. Crossing time: Measure crossing time (in seconds): _____ seconds 7c. Crossing distance: Measure crossing distance (in paces): _____ paces 7d. Length of my stride: _____ feet in my stride				
8. Crosswalk scramble		<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no				
9. Intersection Traffic Calming Features None = 0 1-2 features = 1 3-4 features = 2 5+ features = 3		<input type="checkbox"/> none <input type="checkbox"/> curb extensions/bulbouts <input type="checkbox"/> pavement treatments or lights set in crosswalk <input type="checkbox"/> mini-circles or roundabouts <input type="checkbox"/> speed tables, speed humps or speed bumps <input type="checkbox"/> bike lane at intersection <input type="checkbox"/> partial closures <input type="checkbox"/> dips, drains, or bumps in street <input type="checkbox"/> other (explain: _____)				
10. Additional signs for pedestrians		<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no				

Street Segment Form - CODER'S VERSION		
Fill out this form once for each side of the street.		
Neighborhood: _____	Team Number: _____	Date: _____
Segment ID: _____		
This street is _____ <small style="text-align: center;">Name of this street</small>		
Between: _____ and _____ <small style="text-align: center;">Cross Street 1 Cross Street 2</small>		
Side of street: N S E W		

Vehicle Traffic												
11. Number of lanes (do not include turning-only lanes)	<input type="checkbox"/> 4 4 or more lanes <input type="checkbox"/> 3 3 lanes <input type="checkbox"/> 2 2 lanes <input type="checkbox"/> 1 1 lane <input type="checkbox"/> 0 no lanes											
12. Two-way traffic	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no											
13. Vehicle Speed / Posted Speed Limit	<input type="checkbox"/> 0 not posted	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> 10 10 mph</td> <td style="width: 33%;"><input type="checkbox"/> 35 35 mph</td> </tr> <tr> <td><input type="checkbox"/> 15 15 mph</td> <td><input type="checkbox"/> 40 40 mph</td> </tr> <tr> <td><input type="checkbox"/> 20 20 mph</td> <td><input type="checkbox"/> 45 45 mph</td> </tr> <tr> <td><input type="checkbox"/> 25 25 mph</td> <td><input type="checkbox"/> 50 50 mph</td> </tr> <tr> <td><input type="checkbox"/> 30 30 mph</td> <td><input type="checkbox"/> 55 55+ mph</td> </tr> </table>	<input type="checkbox"/> 10 10 mph	<input type="checkbox"/> 35 35 mph	<input type="checkbox"/> 15 15 mph	<input type="checkbox"/> 40 40 mph	<input type="checkbox"/> 20 20 mph	<input type="checkbox"/> 45 45 mph	<input type="checkbox"/> 25 25 mph	<input type="checkbox"/> 50 50 mph	<input type="checkbox"/> 30 30 mph	<input type="checkbox"/> 55 55+ mph
<input type="checkbox"/> 10 10 mph	<input type="checkbox"/> 35 35 mph											
<input type="checkbox"/> 15 15 mph	<input type="checkbox"/> 40 40 mph											
<input type="checkbox"/> 20 20 mph	<input type="checkbox"/> 45 45 mph											
<input type="checkbox"/> 25 25 mph	<input type="checkbox"/> 50 50 mph											
<input type="checkbox"/> 30 30 mph	<input type="checkbox"/> 55 55+ mph											
14. Street Traffic Calming Features None = 0 1 or more = 1	<input type="checkbox"/> none <input type="checkbox"/> chicanes <input type="checkbox"/> street medians <input type="checkbox"/> speed tables, speed humps or speed bumps <input type="checkbox"/> rumble strips <input type="checkbox"/> speed limit enforcements <input type="checkbox"/> dips, drains, or other unintentional features that slow traffic <input type="checkbox"/> other (explain: - _____)											

Sidewalks

15. Width of sidewalk

0 no sidewalk

1 less than 5 feet

	<input type="checkbox"/> 2 5 feet – 7 feet 11 inches <input type="checkbox"/> 3 8 feet – 11 feet 11 inches <input type="checkbox"/> 4 12 feet or more
16. Sidewalk surface condition-- An impediment is anything which poses a tripping hazard or interrupts the smooth surface of the sidewalk.	<input type="checkbox"/> 0 no sidewalk <input type="checkbox"/> 1 significant impediments in surface <input type="checkbox"/> 2 few impediments in surface <input type="checkbox"/> 3 no impediments in surface
17. Large sidewalk obstructions An obstruction is any object which reduces the width of the sidewalk or hangs low so that people must duck to pass under while on the sidewalk.	<input type="checkbox"/> 0 no sidewalk <input type="checkbox"/> 1 permanent obstructions <input type="checkbox"/> 2 temporary obstructions <input type="checkbox"/> 3 <u>both</u> permanent and temporary obstructions <input type="checkbox"/> 4 no obstructions in sidewalk
18. Presence of curb	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no
19. Driveway cuts	driveway cuts
20. Trees	<input type="checkbox"/> 1 continuously lined <input type="checkbox"/> 2 a few trees; sporadically lined <input type="checkbox"/> 3 no trees
21. Planters/gardens	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no
22. Public seating (including bus stops)	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no
23. Presence of buffers (check all that apply)	<input type="checkbox"/> 1 bike lane <input type="checkbox"/> 1 parallel street parking—not time-restricted <input type="checkbox"/> 1 parallel street parking—time-restricted <input type="checkbox"/> 1 grassy or paved margin <input type="checkbox"/> 1 none
Land Use	
24. Storefront/retail use	_____ shops or businesses of any type
25. Public art/historical sites	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no
Safety and aesthetic qualities	
26. Illegal graffiti	<input type="checkbox"/> 1 Major graffiti

	<input type="checkbox"/> 0 Little or no graffiti																		
27. Litter	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no																		
28. Pedestrian-scale street lighting	<input type="checkbox"/> 1 yes, private <input type="checkbox"/> 2 yes, public <input type="checkbox"/> 3 yes, both private and public <input type="checkbox"/> 0 no																		
29. Construction Sites	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no																		
30. Abandoned/boarded up buildings	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no																		
31. Vacant Lots	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no																		
32. Bike rack(s) present on this street segment	<input type="checkbox"/> 1 yes <input type="checkbox"/> 0 no																		
Perceived Walkability: Please circle the number that your team thinks best describe this street segment.																			
33. Street segment is visually attractive for walking.	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Strongly Agree</td> <td style="text-align: center;">Agree</td> <td style="text-align: center;">Disagree</td> <td style="text-align: center;">Strongly Disagree</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table>	Strongly Agree	Agree	Disagree	Strongly Disagree	1	2	3	4										
Strongly Agree	Agree	Disagree	Strongly Disagree																
1	2	3	4																
34. Street segment feels safe for walking.	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Strongly Agree</td> <td style="text-align: center;">Agree</td> <td style="text-align: center;">Disagree</td> <td style="text-align: center;">Strongly Disagree</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table>	Strongly Agree	Agree	Disagree	Strongly Disagree	1	2	3	4										
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)?	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">No Odors</td> <td style="text-align: center;">A Little Odor</td> <td style="text-align: center;">Some Odors</td> <td style="text-align: center;">A lot of Odors</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table>	No Odors	A Little Odor	Some Odors	A lot of Odors	1	2	3	4										
No Odors	A Little Odor	Some Odors	A lot of Odors																
1	2	3	4																
36. How noisy do you find this street segment?	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">No Noise</td> <td style="text-align: center;">Little Noise</td> <td style="text-align: center;">Some Noise</td> <td style="text-align: center;">A lot of Noise</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table>	No Noise	Little Noise	Some Noise	A lot of Noise	1	2	3	4										
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?	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Not Walkable</td> <td colspan="6"></td> <td style="text-align: center;">Very Walkable</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> <td style="text-align: center;">10</td> </tr> </table>	Not Walkable							Very Walkable	1	2	3	4	5	6	7	8	9	10
Not Walkable							Very Walkable												
1	2	3	4	5	6	7	8	9	10										

Weights and Formulas

Weights for creating PEQI overall score--INTERSECTION

Item	Original Value	Weighted Value
1. Crosswalks	0	8
	1	11
	2	15
	3	18
	4+	21
2. Ladder Crosswalks	0	8
	1	11
	2	16
	3	20
	4+	24
3a. Pedestrian signals WITH countdown	4 with countdowns	21
	3 with countdowns	17
	2 with countdowns	13
	1 with countdown	9
3b. Pedestrian signals WITHOUT countdown	4 without countdowns	19
	3 without countdowns	15
	2 without countdowns	11
	1 without countdown	7
3a or 3b.	None	5
4. Stop signs	0	8
	1	11
	2	16
	3	20
	4+	24
5. No turn on red signs	0	5
	1	8
	2	11
	3	15
	4	19
6. Curb cuts	0	5
	1	8
	2	11
	3	15
	4+	19
7a. Signal at Intersection	0	See Step 1 below
	1	See Step 1 below
7b,c. crossing speed = ((paces*stride)/crossing time)	<=3.5	9
	>3.5	20

8. Scramble	0	5
	1	19
9. Count of intersection TCF's	0	9
	1 or 2	15
	3 or 4	17
	5+	20
10. Additional pedestrian signs	0	7
	1	17

Intersection formula:

How you calculate the score will depend on whether or not there was a traffic signal at the intersection.

<p>TRAFFIC SIGNAL Step 1. IF traffic_signal==1, then add: (pedestrian_signals + no_turn_on_red + crossingspeed+scramble)</p>	<p>NO TRAFFIC SIGNAL Step 1. IF traffic_signal==0, then take: (stop_signs * 2)</p>
<p>TRAFFIC SIGNAL Step 2. Add above to: (crosswalks + ladder_crosswalks + curb_cuts + TCF_count + addl_ped_signs)</p>	<p>NO TRAFFIC SIGNAL Step 2. Add above to: (crosswalks + ladder_crosswalks + curb_cuts + TCF_count + addl_ped_signs)</p>
<p>TRAFFIC SIGNAL Step 3. Adjust the score so that it's range is 0-100 using this formula: (unadjusted score – minimum score) * (100/(max score-min score))</p>	<p>NO TRAFFIC SIGNAL Step 3. Adjust the score so that it's range is 0-100 using this formula: (unadjusted score – minimum score) * (100/(max score-min score))</p>

Weights for creating PEQI overall score—SEGMENTS

Item	Original Value	Weighted Value
lanes	0	24
	1	22
	2	19
	3	9
	4+	4
two-way traffic	0	7
	1	10
speed limit	<20	27
	0 (not posted)	22
	20-25	22
	26-35	12
	35+	2
Count of TCF's in segment	1+	20
	0	7
Sidewalk width	0	4
	1	7
	2	13
	3	19
	4	22
Sidewalk surface condition	3	24
	2	17
	1	7
	0	4
Sidewalk obstructions	4 (no obstructions)	15
	2 (temp obstructions)	10
	1 (perm obstructions)	9
	3 (both temp and perm)	8
	0 (no sidewalk)	5
Curb	1	17
	0	7
Driveway cuts	0	17
	1-5	15
	5+	5
Trees	1	16
	2	11
	3	7
Planters	1	9
	0	4
Public seating	1	13
	0	7

Buffers	bike and parking and margin (all three)	24
	two of the above (any two)	21
	bike only	13
	parking only	13
	margin only	13
	none	4
Retail use	3+	19
	1-2	11
	0	9
Public art	1	14
	0	6
Graffiti	1	5
	0	9
Litter	0	10
	1	5
Ped-scale lighting	3 (both pub and priv)	25
	2 (public only)	20
	1 (private only)	15
	0 (none)	7
Construction	0	13
	1	7
Abandoned buildings	0	13
	1	7
Bike racks	1	10
	0	5
Vacant lots	0	13
	1	7
Visually attractive	1	20
	2	15
	3	10
	4	5
Feels Safe	1	20
	2	15
	3	10
	4	5
Strong Odors	1	20
	2	15
	3	10
	4	5

Noise	1	20
	2	15
	3	10
	4	5
Overall subjective walkability	1	1
	2	3
	3	5
	4	7
	5	9
	6	11
	7	13
	8	15
	9	17
	10	19

Segment formula:

<p>Step 1. Add up the weighted values using this formula: Segment PEQI = (number_lanes + two_way + speed_limit + tcf_count + sidewalk_width + surface + obstructions + curb + curb_cuts + trees + planters + seating + buffers + retail + public_art + graffiti + litter + ped-scale_lights + construction + abandoned_bldgs + bike_racks + vacant_lots + attractive + feels_safe + strong_odors + noisy + walkable)</p>
<p>Step 2. Adjust the score so that it's range is 0-100 using this formula: (unadjusted score – minimum score) * (100/(max score-min score))</p>

Sample Minimum and Maximum Scores: INTERSECTION FORM

Item	Original Value (from Coder's version)	Weighted Value	With a Traffic Signal(s)		Stop sign(s) only	
			MIN With signal s	MAX With signal s	Min Score	Max Score
Crosswalks	0	8	8		8	
	1	11				
	2	15				
	3	18				
	4+	21		21		21
Ladder Crosswalks	0	8	8		8	
	1	11				
	2	16				
	3	20				
	4+	24		24		24
Pedestrian signals	4 with countdowns	21		21		
	4 without countdowns	19				
	3 with countdowns	17				
	3 without countdowns	15				
	2 with countdowns	13				
	2 without countdowns	11				
	1 with countdown	9				
	1 without countdown	7				

	None	5	5			
Stop signs	0	8			16	
	1	11				
	2	16				
	3	20				
	4+	24				48
No turn on red signs	0	5	5			
	1	8				
	2	11				
	3	15				
	4	19		19		
Curb cuts	0	5	5		5	
	1	8				
	2	11				
	3	15				
	4+	19		19		19
crossing speed = ((paces*stride)/cross ing time)	<=3.5	9	9			
	>3.5	20		20		
Scramble	0	5	5			
	1	19		19		

Count of intersection TCF's	0	9	9		9	
	1 or 2	15				
	3 or 4	17				
	5+	20		20		20
Additional pedestrian signs	0	7	7		7	
	1	17		17		17
			61	180	53	149
			Min Score: with signal	Max Score : with signal	Min Score : stop sign only	Max Score: stop sign only

Sample Minimum and Maximum Scores: SEGMENT FORM

Item	Original Value	Weighted Value	Min Score	Max Score
lanes	0	24		24
	1	22		
	2	19		
	3	9		
	4+	4	4	
two-way traffic	0	7	7	
	1	10		10
speed limit	<20	27		27
	0 (not posted)	22		
	20-25	22		
	26-35	12		
	35+	2	2	
Count of TCF's in segment	1+	20		20
	0	7	7	
Sidewalk width	0	4	4	
	1	7		
	2	13		
	3	19		
	4	22		22
Sidewalk surface condition	3	24		24
	2	17		
	1	7		
	0	4	4	

Sidewalk obstructions	none (4)	15		15
	temporary only (2)	10		
	permanent only (1)	9		
	both temp and permanent (3)	8		
	no sidewalk (0)	5	5	
Curb	1	17		17
	0	7	7	
Driveway cuts	0	17		17
	1-5	15		
	5+	5	5	
Trees	1	16		16
	2	11		
	3	7	7	
Planters	1	9		9
	0	4	4	
Public seating	1	13		13
	0	7	7	
Buffers	bike and parking and margin (all three)	24		24
	two of the above (any two)	21		
	bike only	13		
	parking only	13		
	margin only	13		
	none	4	4	
Retail use	3+	19		19
	1-2	11		

		0	9	9	
Public art		1	14		14
		0	6	6	
Litter		0	10		10
		1	5	5	
Graffiti		1	5	5	
		0	9		9
Ped-scale lighting	Private and public		25		25
	public only		20		
	private only		15		
	None		7	7	
Construction		0	13		13
		1	7	7	
Abandoned buildings		0	13		13
		1	7	7	
Bike racks		1	10		10
		0	5	5	
Vacant lots		0	13		13
		1	7	7	
Visually attractive		1	20		20
		2	15		
		3	10		
		4	5	5	
Feels Safe		1	20		20
		2	15		
		3	10		
		4	5	5	

Strong Odors	1	20		20
	2	15		
	3	10		
	4	5	5	
Noise	1	20		20
	2	15		
	3	10		
	4	5	5	
Overall subjective walkability	1	1	1	
	2	3		
	3	5		
	4	7		
	5	9		
	6	11		
	7	13		
	8	15		
	9	17		
	10	19		19
			146	463
			Min Score Segment	Max Score Segment

Pedestrian Environmental Quality Index Training Program



The PEQI was developed by the San Francisco Department of Public Health and modified for the Los Angeles street environment by Mallia Jones, MPH of UCLA

Last modified April 1, 2010

Agenda

1. What is walkability and what does it have to do with health?
2. Street and intersection identification
3. PEQI assessment instructions
4. Practice using the PEQI

What is “walkability”?

- Walkability means the physical environment’s ability to support and encourage walking
- The *quality* and *safety* of the environment from the perspective of pedestrians
- Includes:
 - Safety features
 - Traffic conditions
 - Aesthetic conditions



“Walkability” and your health: 1

1. Walking reduces our dependence on cars
 - This reduces air pollution, noise pollution, traffic accidents



“Walkability” and your health: 2

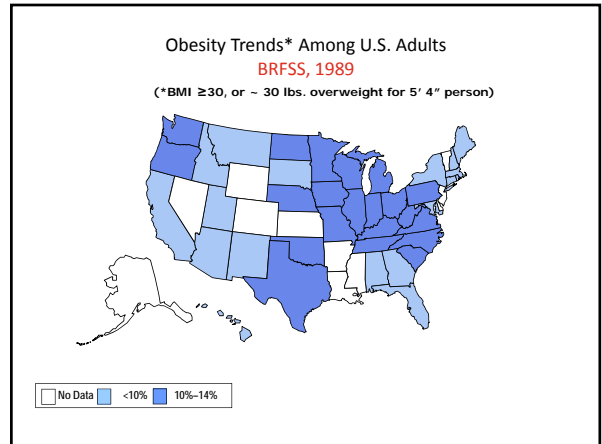
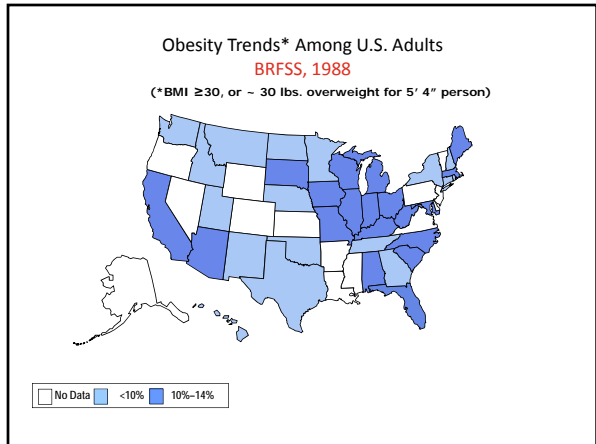
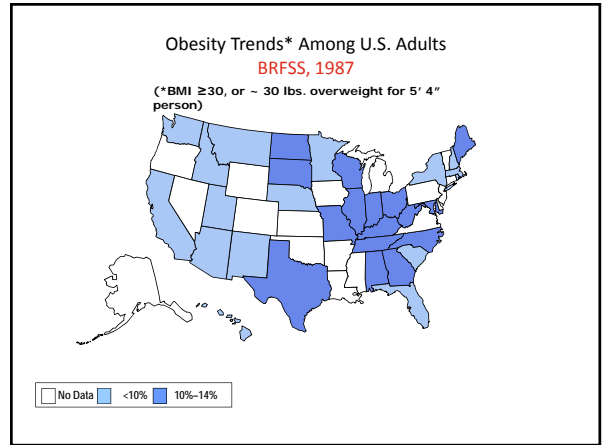
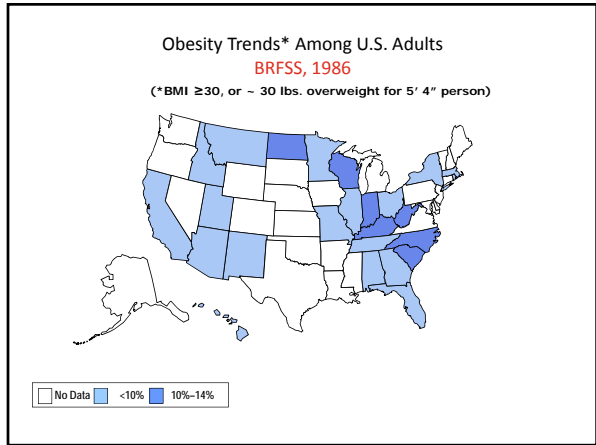
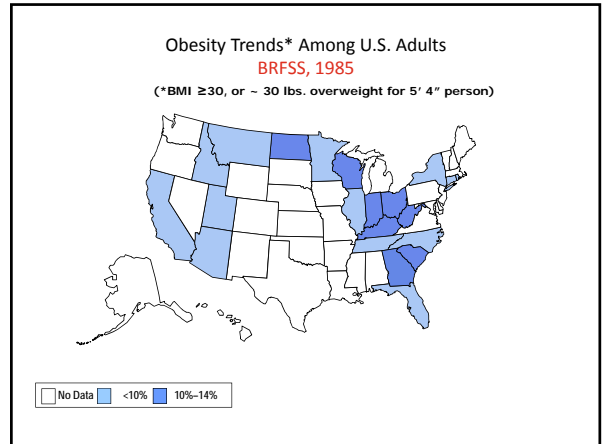
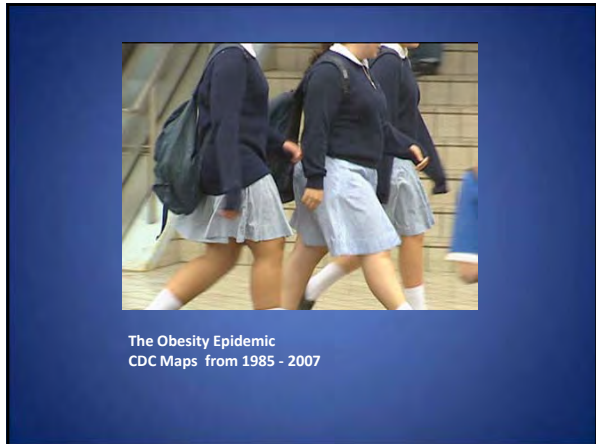
2. Increases physical activity
 - Regular moderate physical activity (such as walking or cycling) reduces the risk of serious disease and obesity

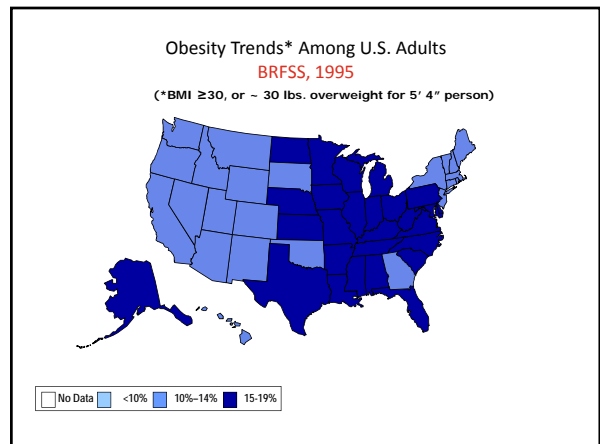
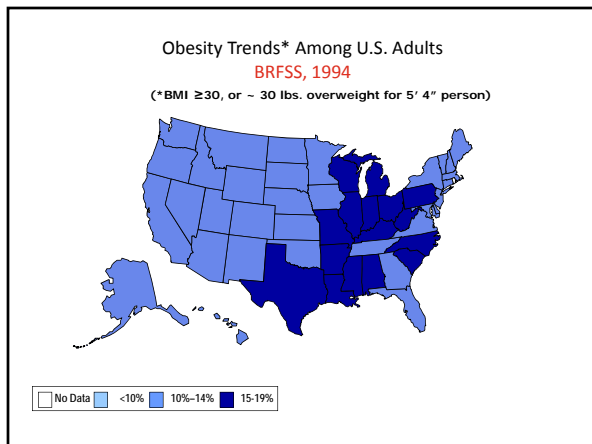
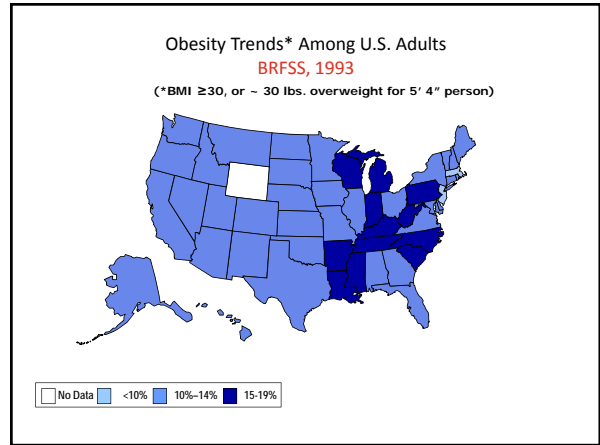
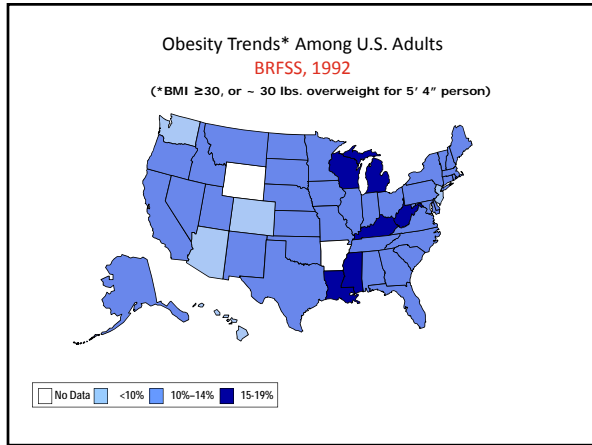
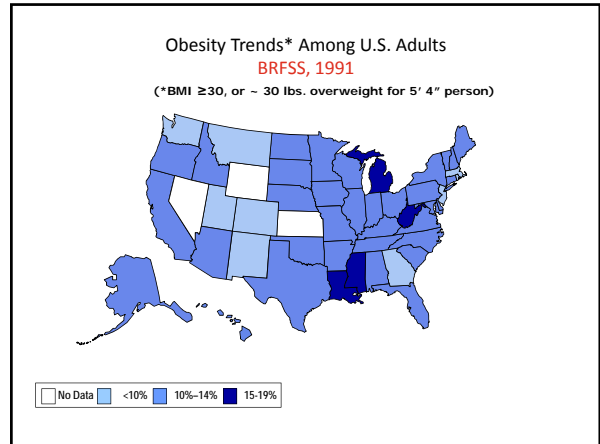
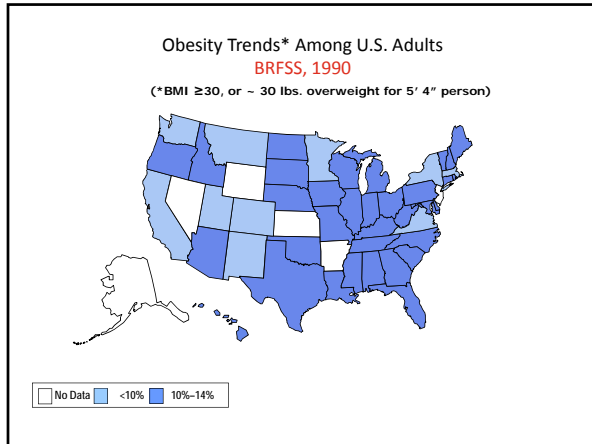


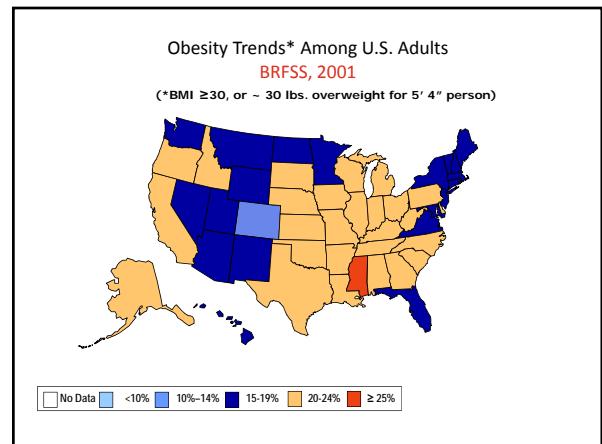
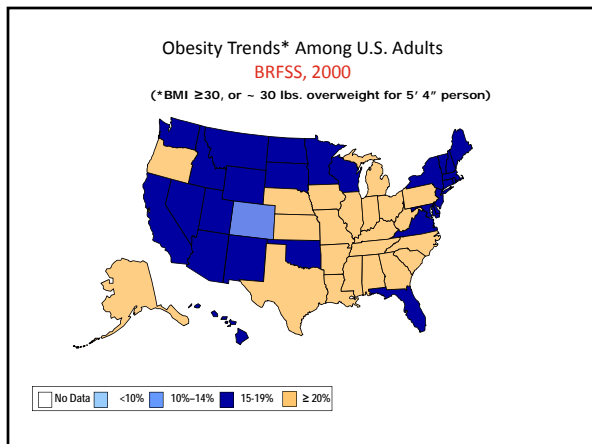
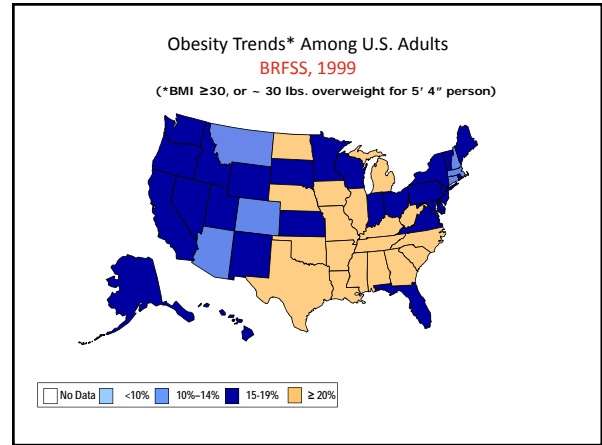
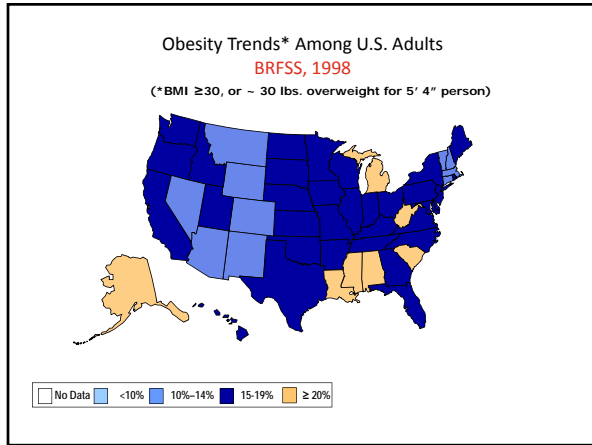
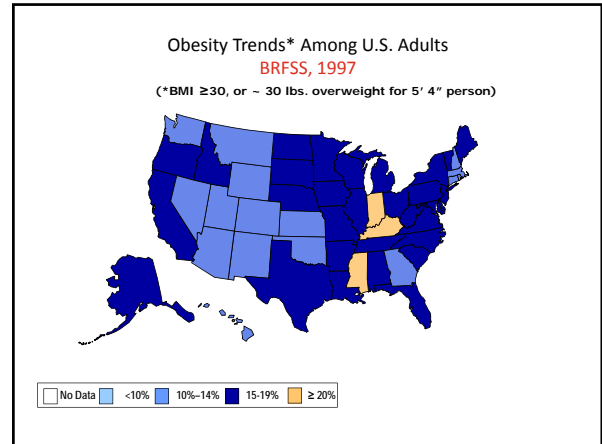
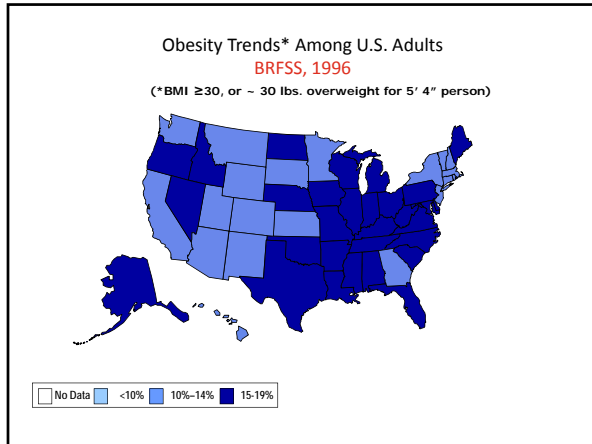
What is obesity?

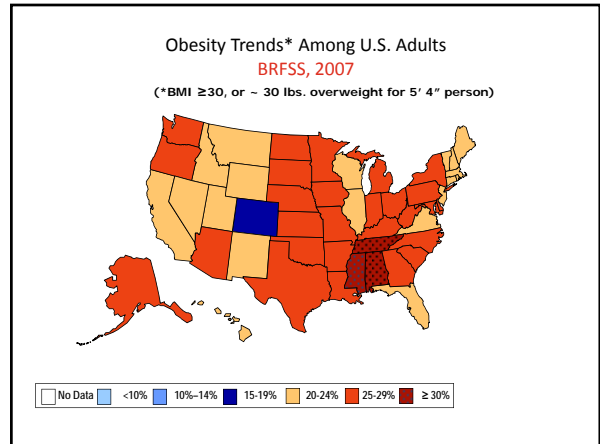
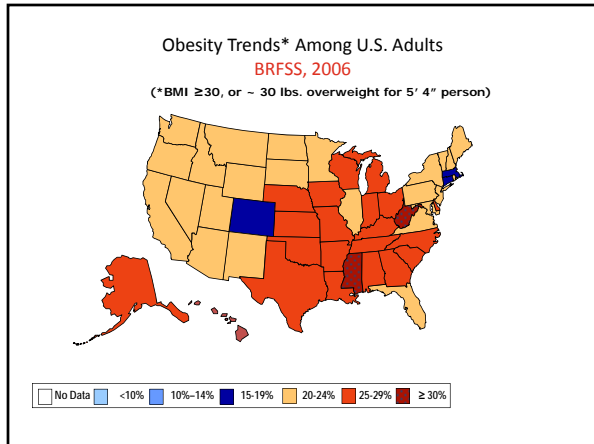
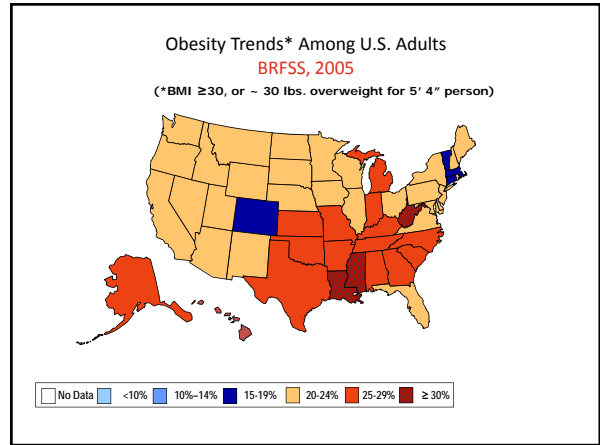
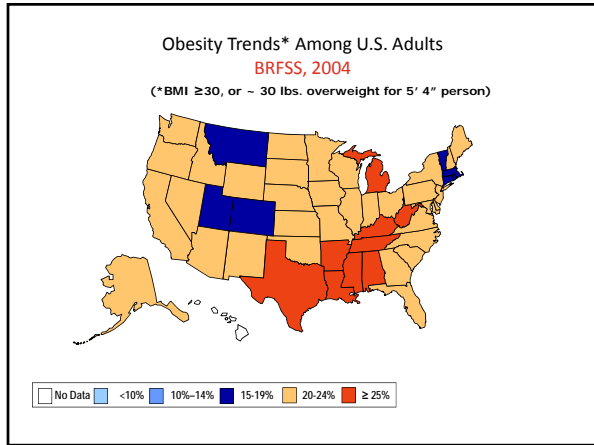
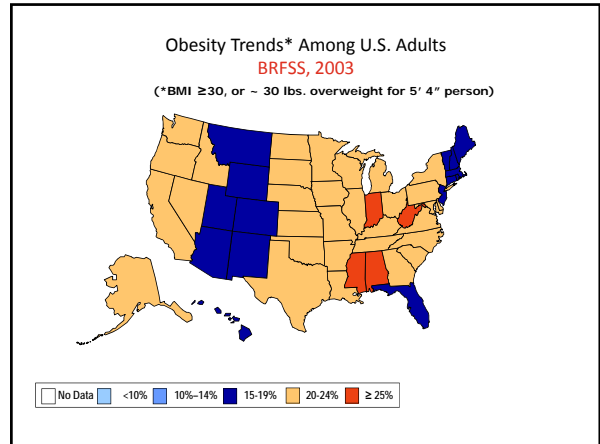
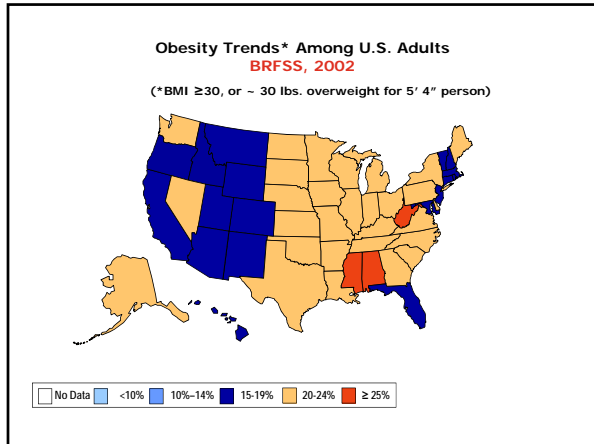
- 30-40 lbs or more above healthy weight
- Depends on height
- For people who are still growing, depends on age & gender

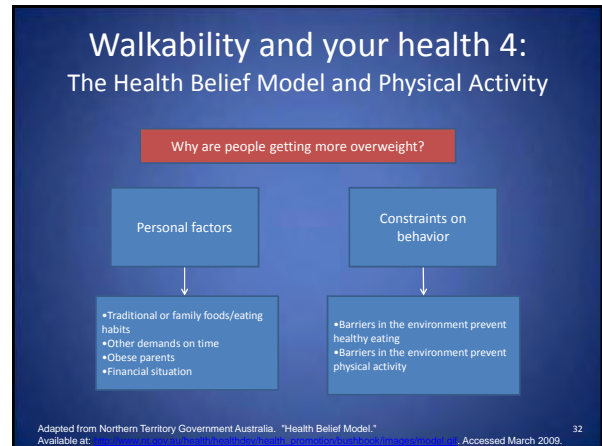
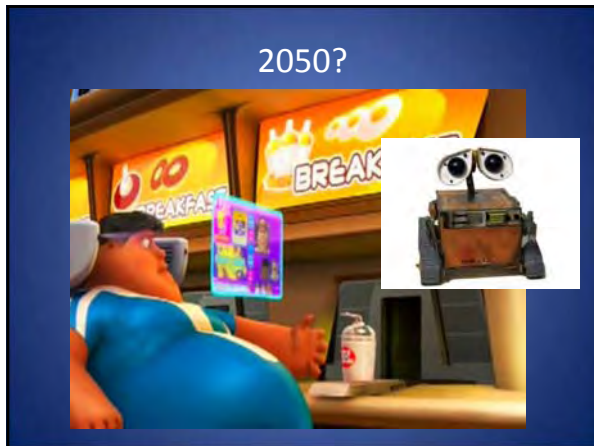












- ### Barriers to walking in the environment
- **Danger** from motor vehicles, crime & violence
 - Lack of **sidewalks** or poor repair/design of sidewalks
 - **Aesthetic qualities** of the area (shade, noise, attractiveness of paths)
 - Existence and quality of **facilities** for exercise (e.g., parks, sports fields/courts, walking paths, etc)
 - **Distance** to destinations
- 33

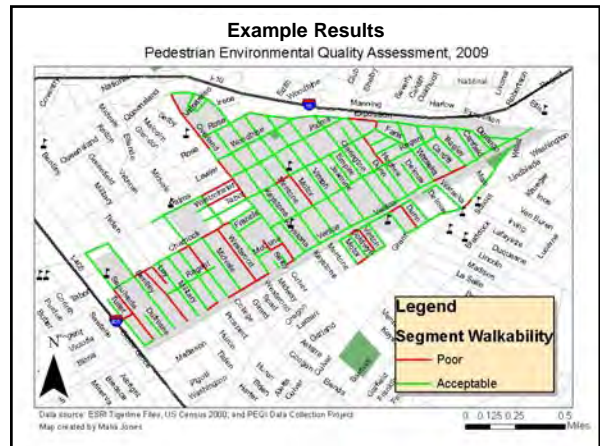
- ### How Assessment Helps
- When we assess the pedestrian environment, we can:
 - Identify problem areas
 - Identify priorities
 - Ask the city to focus on our priorities
 - When we do an on-the-ground assessment we also get to:
 - Meet our neighbors
 - Get to know our neighborhood as pedestrians
 - Eat free food and have a fun day!

The PEQI Form

- ### PEQI Form: overview
- Developed by the SF Dept of Public Health
 - Street segment + intersection items
 - Grouped into 5 Domains:
 - Intersection safety
 - Traffic
 - Street Design
 - Land Use
 - Perceived safety

How it works

- You complete the PEQI form on every street segment and intersection
- We enter the data and use them to compute a PEQI score



Identifying your location

DO THIS RIGHT.



Intersection Identifiers

Neighborhood: Carson	Team Number: 10	Date: 1/30/2010
Intersection Form		
Intersection ID: <u> n </u>		
This is the intersection of: <u> Carson </u> and <u> Dol ores </u>		
<div style="display: flex; justify-content: space-around; width: 100%;"> Street 1 Street 2 </div>		



Segment Identifiers

Neighborhood: Carson	Team Number: 10	Date: 1/30/2010
Segment ID: 32	This street is: Carson	
Name of this street		
Between: Grace and Ravenna	Cross Street 1 Cross Street 2	
Side of street: N (S) E W		



1. Crosswalks

- Designated places for pedestrians to cross the street
- Heighten driver & pedestrian awareness
- X in the box indicating the number of crosswalks

1. Crosswalks

	0 directions	1 directions	2 directions	3 directions	4+ directions
1. Crosswalks					X
2. Ladder crosswalks					
3. Pedestrian signals	a. WITH countdowns				
	b. NO countdowns				
4. Stop signs					
5. No Turn On Red signals/signs					
6. Curb cuts at pedestrian crossings					

2. Ladder Crosswalks

- Crosswalks with large stripes.
- Encourage pedestrians to stay within the safer locations
- More visible to motorists
- X the number of ladder crosswalks present

3a and b. Pedestrian Signal

- Tell pedestrians how much time they have to cross, making it easier for them to make smart choices
- Count the number of directions that have pedestrian signals WITH countdowns
- Count the number of directions that have pedestrian signals WITHOUT countdowns
- X the appropriate boxes
- Mark both items



4. Stop Signs

- Force motorists to slow down
- Allow pedestrians more time to cross
- Count the number of directions this intersection has stop signs



5. No Turn on Red Sign

- Motorists often look to the left when making a right turn, but forget to look to the right for pedestrians
- Count the number of directions for which a "no turn on red" sign is posted and X the appropriate box



6. Curb cuts at pedestrian crossings

- Necessary for people in wheelchairs
- Handy for people using strollers and carts
- Count the # of *directions* where there are curb cuts



6. Curb cutouts at pedestrian crossings

- NOT the number of curb cuts!



6. Curb cutouts at pedestrian crossings



7. Traffic signal at Intersection

- Signal = traffic light
- Check yes or no
- IF YES, then continue to measure the crossing distance and time allowed in 7a & 7b
- IF NO SIGNAL, DO NOT ATTEMPT TO MEASURE.

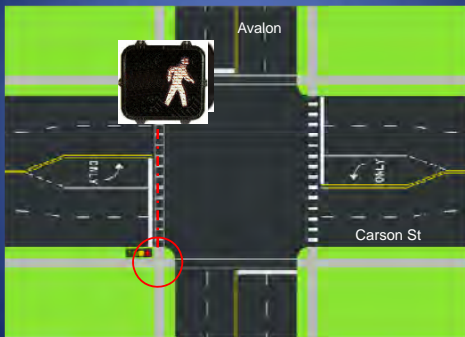


**DO NOT CROSS
WHERE THERE IS
NO TRAFFIC LIGHT.**

7a. Crossing Time

- DO NOT COMPLETE if there is no traffic light
- Use your stopwatch to measure how much time pedestrians are given to cross
 - Time how long is given to cross the **larger** street
 - Use your stopwatch
 - Start when the light turns green OR the walk sign comes on
 - Stop when the light turns red OR the walk sign turns solid red
 - Record the time in seconds

7a. Time to cross: practice scenario



7b. Intersection Length in Paces

- DO NOT COMPLETE if there is no pedestrian signal.
- Cross the larger street
- Count the number of your steps that it takes to cross the street
 - Count from curb to curb
 - Follow the crosswalk if there is one
- Record the number of steps you took
- Write down your stride length in feet

7b. Estimate your stride length now

- Go to the stride length measuring range!
- Start with heels at line
- Take 10 steps in a straight line
- Mark where your heel landed on the 10th step
- WRITE DOWN YOUR STRIDE LENGTH NOW
- You'll have to enter it on every intersection form

7a & 7b. The real story is Crossing Speed

- For a street to be safe for pedestrians, there must be enough time to cross



8. Crosswalk Scramble

- A scramble stops all traffic in all directions while pedestrians cross in all directions.



9. Intersection Traffic Calming Features

- Traffic calming features slow the speed of traffic, increase driver awareness and pedestrian visibility, or provide extra safety for pedestrians
- Check for the presence of each one on the form and others you see that are not listed
 - Check all that apply
 - If the same one appears twice, just check it once
 - If you see one not listed, write it down under “other”

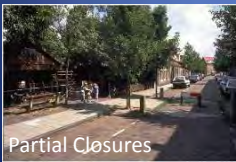
9. Traffic Calming Features



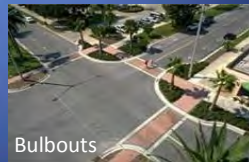
Bike Lanes



Pavement Treatments



Partial Closures



Bulbouts

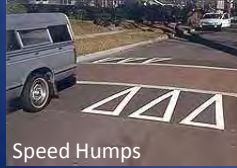
9. MORE Traffic Calming Features



Speed Tables



Mini-Circles

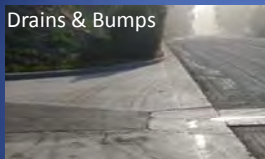


Speed Humps



Median

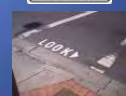
9. MORE Traffic Calming Features



Drains & Bumps

10. Additional Pedestrian Signage

- Signs can increase driver and pedestrian awareness
- Mark ‘yes’ if there are any signs related to pedestrians at the intersection (other than the walk signal)



Pedestrian Environmental Quality Index for Android Smartphones Toolkit for Implementation

PEQI App Full Protocol UCLA v2 Table of Contents

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

Android smartphone PEQI application and tutorial

can be downloaded from: www.peqiwalkability.appspot.com

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 PEQI data collection volunteers. (English & Spanish)	see website above
Illustrated Guide “Cheatsheet”	This handout is useful during the training and for users while collecting data. (English & Spanish)	see website above
Training Quizzes	These PowerPoint Intersection & Segment quizzes can help to refresh or reinforce your trainings.	see 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 highlight 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 sidewalk 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 precedence, 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 sidewalk 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 driver awareness, 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.

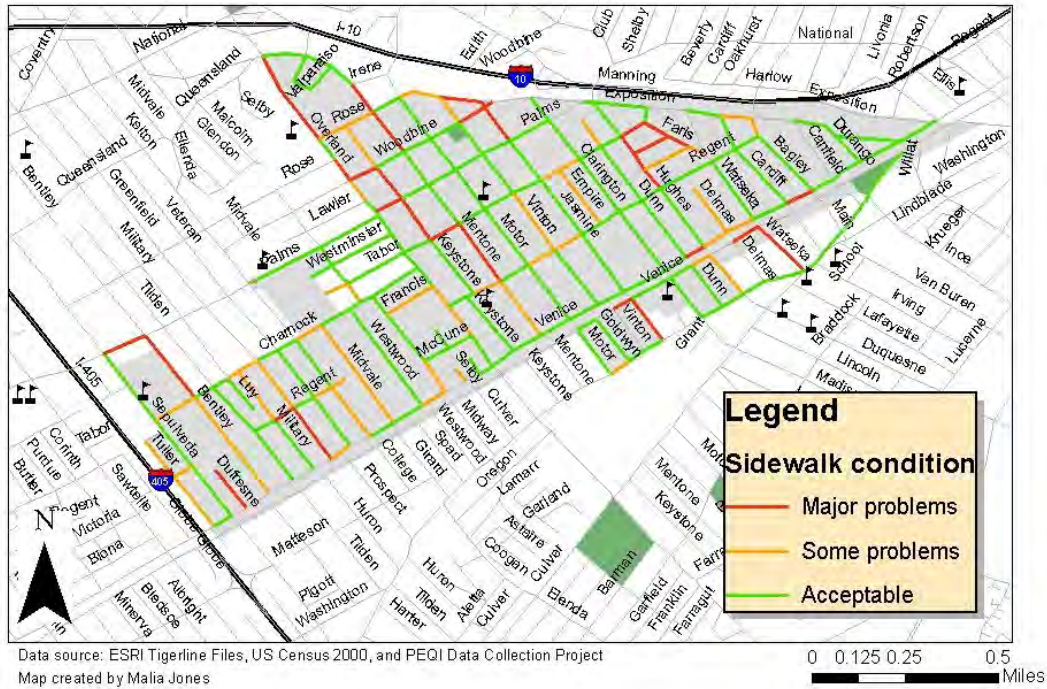
Data about walkability can be used to identify priority areas for improving the walkability of an area. Either the individual data elements or the index, or both together, can be used to show what elements and what specific streets/intersections need the most help.

The PEQI is designed to be collected by volunteer data collectors. The complete toolkit, available at www.coeh.ucla.edu/node/127 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.

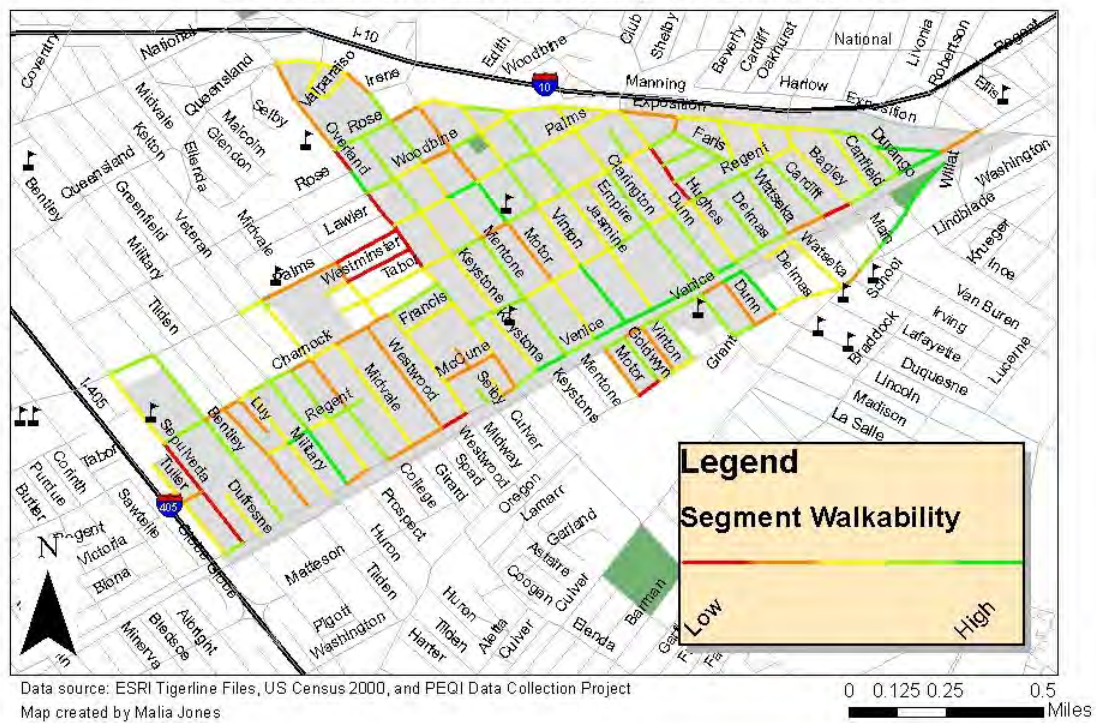
PEQI was developed in 2008 by the San Francisco Department of Public Health. The original survey instrument and materials about its development are available at their website: http://www.sfphes.org/HIA_Tools_PEQI.htm

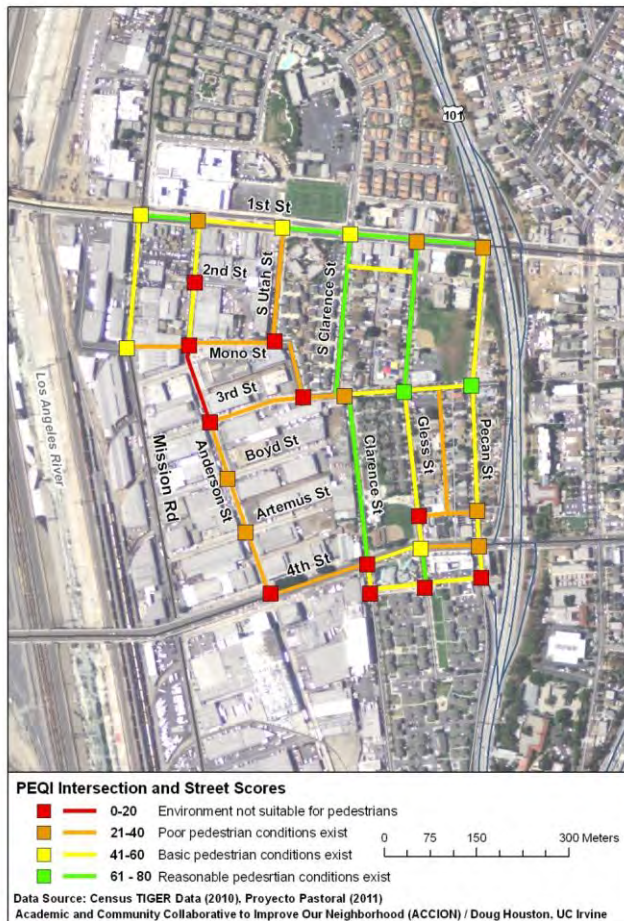
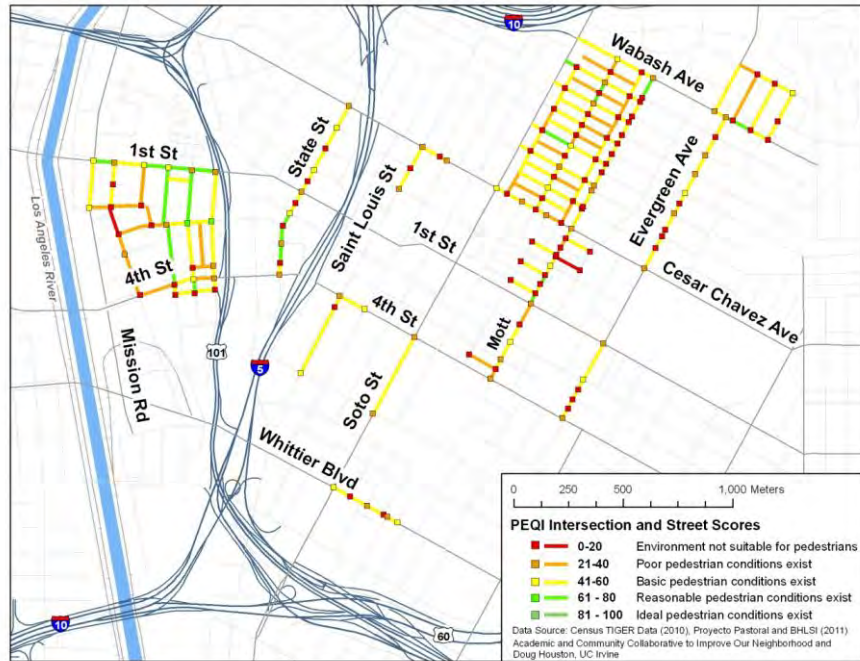
The PEQI was modified for use in Los Angeles by Malia Jones, MPH. Key changes were made to the original instrument in order to make it applicable to the Los Angeles Environment.

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.

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

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 www.peqiwalkability.appspot.com

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 ½ 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 EXTREMELY IMPORTANT that your data collectors accurately identify the PROJECT NAME EXACTLY 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 www.coeh.ucla.edu/node/127 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 www.peqiwalkability.appspot.com 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 <i>(sample only- download phone form from website)</i>																																						
Team (names): _____				Date: _____																																		
Intersection ID: _____																																						
This is the intersection of : _____ and _____ <div style="display: flex; justify-content: space-around; width: 100%;"> Street 1 Street 2 </div>																																						
		0 directions	1 directions	2 directions	3 directions	4+ directions																																
1. Crosswalks																																						
2. Ladder crosswalks																																						
3. Pedestrian signals	a. WITH countdowns																																					
	b. NO countdowns																																					
4. Stop signs																																						
5. No Turn On Red signals/signs																																						
6. Curb cuts at pedestrian crossings																																						
7. Signal at intersection		<input type="checkbox"/> yes <input type="checkbox"/> no → if no, skip to item 8																																				
<p>Cross street <u>ONLY</u> with a green light or walk signal. Measure across larger street.</p> <p>a. Crossing time: Measure crossing time (in seconds): _____ seconds</p> <p>b. Crossing distance: Measure crossing distance (in paces): _____ paces</p> <p>Length of my stride: _____ feet in my stride</p>																																						
8. Crosswalk scramble		<input type="checkbox"/> yes <input type="checkbox"/> no																																				
9. Intersection Traffic Calming Features		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: left;">Yes</th> <th style="width: 10%; text-align: left;">No</th> <th></th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>pavement treatments</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>median or middle-divider</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>mini-circles or roundabouts</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>speed tables, speed humps or speed bumps</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>bike lane at intersection</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>partial closures</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>drains, dips or other unintentional features that slow traffic</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>curb extensions/bulb-outs</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>lights set in crosswalk</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>other (explain: _____)</td> </tr> </tbody> </table>				Yes	No		<input type="checkbox"/>	<input type="checkbox"/>	pavement treatments	<input type="checkbox"/>	<input type="checkbox"/>	median or middle-divider	<input type="checkbox"/>	<input type="checkbox"/>	mini-circles or roundabouts	<input type="checkbox"/>	<input type="checkbox"/>	speed tables, speed humps or speed bumps	<input type="checkbox"/>	<input type="checkbox"/>	bike lane at intersection	<input type="checkbox"/>	<input type="checkbox"/>	partial closures	<input type="checkbox"/>	<input type="checkbox"/>	drains, dips or other unintentional features that slow traffic	<input type="checkbox"/>	<input type="checkbox"/>	curb extensions/bulb-outs	<input type="checkbox"/>	<input type="checkbox"/>	lights set in crosswalk	<input type="checkbox"/>	<input type="checkbox"/>	other (explain: _____)
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<input type="checkbox"/>	<input type="checkbox"/>	lights set in crosswalk																																				
<input type="checkbox"/>	<input type="checkbox"/>	other (explain: _____)																																				
10. Additional signs for pedestrians		<input type="checkbox"/> yes <input type="checkbox"/> no																																				

PEQI: Segment Form *(sample only- download phone form from website)*

Team (names): _____

Date: _____

Segment ID: _____

This street is _____
Name of this street

Between: _____ and _____
Cross Street 1 Cross Street 2

Vehicle Traffic

11. Number of lanes

Do not include turn only lanes

- 4 or more lanes
- 3 lanes
- 2 lanes
- 1 lane
- no lanes

12. Two-way traffic

- yes no

**13. Vehicle Speed /
Posted Speed Limit**

- | | | |
|-------------------------------------|---------------------------------|----------------------------------|
| <input type="checkbox"/> not posted | <input type="checkbox"/> 10 mph | <input type="checkbox"/> 35 mph |
| | <input type="checkbox"/> 15 mph | <input type="checkbox"/> 40 mph |
| | <input type="checkbox"/> 20 mph | <input type="checkbox"/> 45 mph |
| | <input type="checkbox"/> 25 mph | <input type="checkbox"/> 50 mph |
| | <input type="checkbox"/> 30 mph | <input type="checkbox"/> 55+ mph |

**14. Street Traffic
Calming Features**

*Indicate if any of the
following are present*

- | | | |
|--------------------------|--------------------------|--|
| Yes | No | |
| <input type="checkbox"/> | <input type="checkbox"/> | street median |
| <input type="checkbox"/> | <input type="checkbox"/> | speed tables, speed humps or speed bumps |
| <input type="checkbox"/> | <input type="checkbox"/> | drains, dips or other unintentional features that slow traffic |
| <input type="checkbox"/> | <input type="checkbox"/> | chicanes |
| <input type="checkbox"/> | <input type="checkbox"/> | rumble strips |
| <input type="checkbox"/> | <input type="checkbox"/> | speed limit enforcements |
| <input type="checkbox"/> | | other (explain: _____) |

Sidewalks

15. Width of sidewalk

- no sidewalk
- less than 5 feet
- 5 feet – 7 feet 11 inches
- 8 feet – 11 feet 11 inches
- 12 feet or more

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

28. Pedestrian-scale street lighting <i>Choose only one option from the right.</i>	<input type="checkbox"/> yes, private <input type="checkbox"/> yes, public <input type="checkbox"/> yes, both private and public <input type="checkbox"/> no pedestrian-scale street lighting																					
29. Construction Sites	<input type="checkbox"/> yes <input type="checkbox"/> no																					
30. Abandoned/boarded up buildings	<input type="checkbox"/> yes <input type="checkbox"/> no																					
31. Vacant Lots	<input type="checkbox"/> yes <input type="checkbox"/> no																					
32. Bike rack(s) present on this street segment	<input type="checkbox"/> yes <input type="checkbox"/> no																					
Perceived Walkability: Please circle the number that your team thinks best describe this street segment.																						
33. Street segment is visually attractive for walking.	<table><tr><td>Strongly Agree</td><td>Agree</td><td>Disagree</td><td>Strongly Disagree</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	Strongly Agree	Agree	Disagree	Strongly Disagree	1	2	3	4													
Strongly Agree	Agree	Disagree	Strongly Disagree																			
1	2	3	4																			
34. Street segment feels safe for walking.	<table><tr><td>Strongly Agree</td><td>Agree</td><td>Disagree</td><td>Strongly Disagree</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	Strongly Agree	Agree	Disagree	Strongly Disagree	1	2	3	4													
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)?	<table><tr><td>No Odors</td><td>A Little Odor</td><td>Some Odors</td><td>A lot of Odors</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	No Odors	A Little Odor	Some Odors	A lot of Odors	1	2	3	4													
No Odors	A Little Odor	Some Odors	A lot of Odors																			
1	2	3	4																			
36. How noisy do you find this street segment?	<table><tr><td>No Noise</td><td>Little Noise</td><td>Some Noise</td><td>A lot of Noise</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	No Noise	Little Noise	Some Noise	A lot of Noise	1	2	3	4													
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?	<table><tr><td colspan="4">Not Walkable</td><td colspan="6"></td><td colspan="1">Very Walkable</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr></table>	Not Walkable										Very Walkable	1	2	3	4	5	6	7	8	9	10
Not Walkable										Very Walkable												
1	2	3	4	5	6	7	8	9	10													



Statutory Authorization: 10
 Type: NONREGULATORY
 Related Topic Areas: History
 Source Protection Regulation

The VNRC provides a webpage dedicated to Open space conservation plans:
<https://vnrc.org/community-planning-toolbox/tools/conservation-and-open-space-plans/>

Chapter 118
 Open Space & Re-

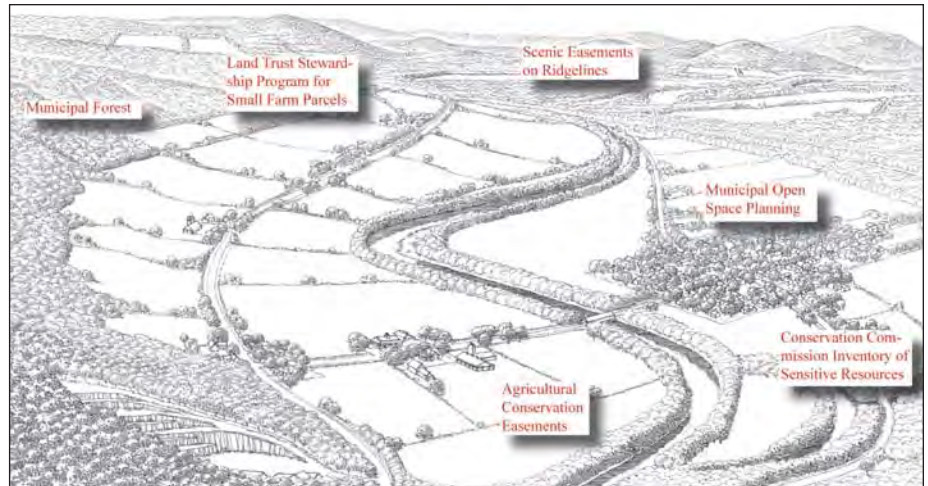
Open Space & Resource Protection Programs

18

Overview

The term *open space* can mean many things—wooded hillsides, open farm fields, land set aside for natural, historic, and scenic resource protection or for public access and recreation, or all undeveloped land in a community. When creating a local conservation program, it's necessary to determine how open space is defined locally in relation to its context, meaning, and importance to the community.

The municipal plan should provide some guidance. Under the Vermont Planning and Development Act (24 V.S.A. Chapter 117), the plan must include policies regarding the “preservation of rare and irreplaceable natural areas, scenic and historic fea-



Communities can protect open space using many nonregulatory tools, from creative planning and management to purchase of land and conservation easements. Local stewardship is essential both to protect open space resources from immediate threats and to maintain them for future generations.

tures, and resources.” The land use section of the plan must also identify areas proposed for forests, recreation, and agriculture, and ... “open spaces reserved for floodplain, wetland protection, or other conservation purposes...” A local conservation or open space protection program—and many of the tools used to preserve open space, natural, historic, and scenic resources—must conform to the municipal plan’s resource protection and land use goals and to specific plan policies and recommendations. The first step then, in conserving local land and resources, is to review the municipal plan and related maps.

There are a variety of techniques available at the local level to protect resources and to preserve open space, including both nonregulatory options—the subject of this paper—and regulatory options that are covered under related topics. The most effective conservation programs generally rely on a combination of both regulatory and nonregulatory tools, crafted to fit local needs and

circumstances. The options most appropriate for local use depend in large part on community goals and objectives and the municipal, volunteer, and financial resources available to administer local programs. The municipal plan again should be consulted for guidance.

Conservation Commissions

Vermont passed legislation in 1977 allowing municipalities to establish conservation commissions (24 V.S.A. Chapter 118). A conservation commission can be created at any time by a vote of the municipality or by the legislative body. The commission is a volunteer board, consisting of three to nine appointed members, whose purpose is to promote the long-term stewardship of a community’s natural and cultural resources. The commission serves in an advisory capacity to local officials, including the legislative body, planning commission, and zoning or development review board.

Definition of Open Space

Example: 2006 Shelburne Open Space Conservation Plan

For the purposes of this Plan, open space is defined as an area of Shelburne’s landscape that is essentially undeveloped, such as ridges, streams, woodlands, wetlands, shorelines, and agricultural lands. Open space lands typically have no buildings or other complex human-made structures in current service, except for active farms with barns and other agricultural structures. These lands may be in their natural state, serving important environmental and/or aesthetic functions, or they may be used for agriculture, forestry, and/or low-impact recreation. Either way, they help maintain the condition and function of Shelburne’s natural resources, which are essential to the Town’s outstanding quality of life.

Powers and Duties of Conservation Commissions

24 V.S.A. §4505

- Inventory and conduct ongoing studies of natural, scenic and cultural resources in the community.
- Maintain inventories of lands within the municipality that have historic, educational, cultural, scientific, architectural or archaeological values in which the public has an interest.
- Recommend to the legislative body the purchase or receipt of gifts of land or interests in land.
- Administer lands, properties or rights that have been acquired by the municipality.
- Provide environmental evaluations where pertinent for the local or state review of development applications
- Cooperate with local officials, and other local and private organizations, on matters affecting the local environment and natural resources of the community.
- Encourage, through educational activities, the public understanding of local natural resources and conservation needs.

(See statute for a complete list of powers and duties.)

State-enabling legislation describes—but does not mandate—the commission's powers and duties. Each conservation commission can tailor its activities and projects to address local conservation needs and priorities. There are currently more than ninety established conservation commissions, or committees, in Vermont.

Often, it's the conservation commission that helps the planning commission identify and inventory a community's natural, cultural, and scenic resources, including those lands that have natural, cultural, educational, or recreational value, for reference or inclusion in the municipal plan. The commission may also be charged with the preparation of a conservation or open space plan that more specifically identifies local conservation goals and priorities and strategies for achieving them.

The conservation commission may recommend the acquisition or receipt of gifts of land or interests in land (such as easements) and, if authorized by the legislative body, may administer land or interests in land on behalf of the municipality.

The conservation commission is also authorized under Chapter 117 (§4464) to review and comment on development applications, work with applicants to address resources potentially affected by proposed development, and present its findings and recommendations on a particular project to the planning commission, zoning, or development review board during the public hearing process.

Perhaps most important, a conservation commission can take on an educational role and provide information and technical assistance to local property owners interested in conserving their land and resources.

More information about conservation commissions in Vermont is available from the Association of Vermont Conservation Commissions (AVCC). The *Vermont Conservation Commission Handbook*, available through the AVCC, provides a wealth of information about starting and funding a local conservation commission. The association also holds an annual conference and issues newsletters to members that highlight commission activities throughout the state.

Open Space Plans

Municipal plans and maps, as noted above, are required to identify areas proposed for farming, forestry, recreation, and open space, but in the context of a comprehensive plan, this information often is not presented in enough detail to support specific conservation strategies and programs. A conservation or open space plan, prepared by a local planning or conservation commission, identifies and addresses in more detail community conservation objectives. To have legal standing, the open space plan should be incorporated by reference in, or

adopted as an amendment to, the municipal plan.

An open space plan typically includes an inventory and map of resources and lands to be conserved as open space; related goals, objectives, and strategies as determined through a public process; and a set of short- and long-term conservation priorities, which may include specific projects to be undertaken and financed by the community—for example, through a local conservation fund.

Open space plans are especially useful sources of information in the development review process for both applicants and boards. The open space plan can be used to:

- flag important natural and cultural resources on properties to be developed—through site visits and more detailed fieldwork may also be necessary;
- inform applicants up front about local conservation priorities; and
- ensure that land conserved as part of an individual development project fits within the community's overall plan for open space protection.

The Vermont Department of Fish and Wildlife's *Conserving Vermont's Natural Heritage: A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity* is an especially helpful guide for use in the preparation of conservation and open space plans. The guide, published by the department in 2004, includes a discussion of the state's significant natural resources, sample language, strategies, and a comprehensive list of resources.

Open Space Plans in Statute

24 V.S.A. §4432(3)

One of three types of "supporting plans" specifically identified in Chapter 117 as a nonregulatory plan tool to implement the municipal plan is an open space plan "to guide public and private conservation strategies."

Land Evaluation and Site Assessments

Land evaluation and site assessments (LESAs) are used to systematically evaluate and rank resource lands for protection, often for inclusion in community open space or conservation plans. First developed in 1981 by the U.S. Natural Resource Conservation Service (then the Soil Conservation Service) to rank agricultural land under federal farmland protection programs, LESAs have since been modified for local use and to evaluate other resources such as forestland (FLESAs).

As implied in the name, there are two parts to a LESA: a land evaluation that evaluates the physical properties of a parcel, including soil characteristics identified by the NRCS, and a site assessment that evaluates the parcel in relation to other site criteria, such as parcel size, relationship to nearby land uses, applicable land use regulations, tax status, and proximity to developed areas. These criteria are developed locally, assigned points that may be weighted according to local priorities, and are then used to evaluate and rank individual parcels. The Vermont Housing and Conservation Board, the Vermont Land Trust, and District Environmental Commissions also refer to LESAs adopted by municipalities for their funding and regulatory programs. LESAs used in these contexts present a clear statement of local public policy with regard to farmland, forestland, and natural resource protection.

In the 1980s and 1990s, a number of Vermont municipalities developed LESAs to evaluate and rank farm or forest parcels for inclusion in municipal and open space plans and for priority consideration under local conservation programs. It was, however, very labor intensive. As a result, many LESAs, once developed, were never maintained or updated. The use of computerized mapping and geographic information systems

has made both LESA development and maintenance much easier. For more information on LESAs, contact your regional planning commission.

Conservation Funds

Municipalities are allowed to acquire real property or rights or interests in property for conservation purposes through purchase, donation, transfer, or other accepted methods (10 V.S.A. Chapter 155). A conservation fund is a dedicated fund set up by a municipality to finance conservation projects in the community. The first local conservation fund in the state, the Norwich Conservation Trust Fund, was established in 1974. Since then, nearly thirty Vermont municipalities have created such funds.

Most local conservation funds are types of reserve funds that, under related state law (24 V.S.A. §2804), are established by a vote of the municipality and placed under the control of the legislative body. Conservation funds, however, also have been established by conservation commissions in their capacity (under 24 V.S.A. §4505) to “receive money, grants or private gifts from any source” for conservation purposes.

Sources of money include annual appropriations in the form of a lump sum, under a separately warned article or line item in the budget, or as a dedicated portion of the property tax rate, such as a “penny for conservation” initiative. They may also include other sources of municipal revenue (for example, timber sales), grants, and tax-deductible gifts or donations. Local fund-raising efforts are often undertaken to supplement municipal appropriations.

Once established, the fund is managed by the legislative body, generally in cooperation with the conservation commission. Projects funded through a conservation fund may be included in a municipality’s capital budget and program or may be used as opportunities arise. Though typically used to purchase land or ease-

ments, conservation funds can also be used to purchase options on land, rights of first refusal, and long-term leases and to cover associated costs, including appraisals, surveys, and legal work. A few municipalities, such as Williston and Brattleboro, also use their conservation fund to support local grant and loan programs.

The administration of a local conservation fund involves maintaining adequate financial records (a job usually handled by the municipal clerk or treasurer), developing policies and evaluation criteria for the use of the fund, and related application procedures.

Local conservation funds are often used to leverage or match other sources of funding needed to finance larger conservation projects. In a very competitive funding environment, a local conservation fund can provide matching money and, more important, show that the community has a

Vermont Housing and Conservation Trust Fund

10 V.S.A. Chapter 15

Established by the legislature in 1987, the Vermont Housing & Conservation Trust Fund is, in effect, a statewide conservation fund that is intended to support the dual goals of creating affordable housing for Vermonters, and conserving and protecting valuable farmland, historic properties, and important natural and recreational areas.

The Housing and Conservation Trust Fund is funded in part through property transfer tax revenues ? though typically not at the full 50 percent of annual revenues as established under state law. The state fund is also used to leverage other sources of money, including federal housing and conservation program funds.

The Housing and Conservation Trust Fund is administered by the Vermont Housing and Conservation Board. Funds are made available for local projects generally on a competitive basis. For more information and application forms, contact the VHCB at www.vhcb.org.

long-term commitment to local land conservation and stewardship. More information about establishing a local conservation fund is available through the Vermont League of Cities and Towns and the Association of Vermont Conservation Commissions.

Land Trusts

A land trust is a nonprofit organization that, as all or part of its mission, conserves land by:

- acquiring land or interests in land—for example conservation easements;
- assisting property owners, communities, and other organizations to conserve land; and
- providing long-term stewardship of protected land.

There are currently over thirty local, regional, state, and national land trusts working in Vermont. The most active and well known is the Vermont Land Trust—now a statewide organization that began in 1977 as a local nonprofit to preserve open space in the Woodstock region (www.vlt.org). The Vermont Land Trust has since opened six field offices throughout the state to assist private landowners, local communities, and partner organizations, including local land trusts. As of 2005, the Vermont Land Trust had helped protect more than 440,000 acres of land throughout the state, including 400 parcels in active agricultural use.

A number of smaller local and regional land trusts have formed around the state over the last two decades to focus on more targeted areas or to take on projects that are not a priority for larger land trusts. These groups may cover one or more municipalities and actively pursue conservation projects within their designated area.

Local land trusts often work in partnership with larger land trusts to secure funding and to ensure long-term monitoring and stewardship of conserved parcels. Enforcing easements in perpetuity can be a monumental task for a local group.

Several communities have both a

conservation commission and a local land trust. Conservation commissions can serve the same functions as a land trust, but may not have the time or expertise to undertake and manage long-term projects; in some cases, a local land trust has been organized at the recommendation of the conservation commission. A land trust, as a private nonprofit entity, is not accountable to local government and therefore has more flexibility in its work. It does not, however, have the same role as the conservation commission in influencing public policy or participating in local planning and development review. Local conservation efforts are best served when conservation commissions and land trusts work closely together.

When deciding which type of organization is most appropriate locally, it's important to consider both the overall objectives in forming the group and available resources. Land trusts, as nonprofit organizations, typically depend on volunteers and funding from members and outside sources to survive. Where volunteer, staffing, and financial resources are limited, it may be more effective to form a conservation commission or to work through an existing land trust rather than start a new one.

Conservation Easements

Conservation easements are one of the most powerful, flexible tools available to conserve private land. A conservation easement is a recorded legal agreement between a landowner and the municipality or another nonprofit organization, such as a land trust, that permanently restricts the use of a property to protect its conservation values. The easement represents an interest in land that may be purchased, such as through the purchase of development rights, or voluntarily donated by the landowner. The landowner continues to own the property and pay taxes on it, but per-

manently gives up certain agreed-upon rights. Future owners are also bound by the terms of the agreement. It's important to note that easements do not necessarily guarantee public access; public access to private property is allowed only if granted by the landowner, as stated in the easement agreement.

Conservation easements have been used by communities, and by a variety of local land trusts and organizations, to protect open space throughout Vermont. More than 360,000 acres of land are currently under easement in the state, including nearly 100,000 acres of farmland. Easements are often held jointly—for example, through a local land trust, the Vermont Land Trust, the Vermont Housing Conservation Board, or another state agency.

Benefits to the landowner include permanent protection of the land and income from the sale of development rights or tax benefits from a donation. Benefits to the community include the preservation of open space, farmland, woodland, natural and scenic areas, wildlife habitat, and water quality.

Easements are an extraordinarily flexible land-saving tool, but there are some associated costs to the municipality or group that holds the easement. These include the regular costs of doing business in acquiring the easement, such as legal fees, surveys, and appraisals, as well as ongoing costs associated with monitoring, managing, and enforcing the conditions the easement.

More information about the use of easements in Vermont to conserve land is available from the Vermont Housing and Conservation Board and the Vermont Land Trust.

Stewardship Programs

Local stewardship programs—developed and administered by the municipality, a conservation commission, land trust or other nonprofit organi-

zation—focus on the sustainable, long-term management of publicly and privately conserved lands and resources. The first step generally involves the preparation of a long-term management plan for particular parcel—for example, a town forest—or for specified natural or cultural resources. Management plans are required for many public lands, including land under conservation easements, and for participation in federal and state land programs, such as Vermont’s use value appraisal (current use) tax abatement program for forest- and farmland. Management plans also are often required as a condition of state or local approval for development that could impact identified natural or cultural resources, such as a subdivision in the vicinity of a deer wintering yard or a ski area near critical bear habitat.

Management plans may focus on one area, but often integrate management of more than one type of resource, based on community or landowner interests and management objectives. Management objectives in some cases may conflict, resulting in

the need to set priorities in relation to overall management goals for the property. Resources identified on the ground and mapped may include:

- topography, including steep slopes (15 percent or more), prominent peaks and ridgelines.
- groundwaters, including known aquifers and water source protection areas
- surface waters, including streams, floodplains, wetlands, vernal pools, and aquatic habitats
- earth resources, including commercially viable sand and gravel pits, rock quarries, or mineral deposits
- wildlife habitat, including core habitat areas (mast stands, deeryards, and breeding areas) and connecting travel corridors
- rare, threatened, and endangered plant and animal communities
- designated ecological zones
- forestland, including forest stand types and conditions, commercially viable timber stands, and critical habitat areas
- agricultural land, including soil types and physical properties
- recreation resources, including exist-

Vermont’s Use Value Appraisal Program

32 V.S.A. Chapter 24

The state’s use value appraisal program, also known as the Current Use Program, enables landowners who practice long-term farm- and forestland management to have their land appraised for taxation purposes at its current use, rather than fair market, value. This is a voluntary program that can result in significant property tax savings for participating landowners. For program enrollment and continued eligibility, the land must be actively managed under an approved management plan. If the land is withdrawn from the program, or managed or developed improperly, a land use change tax is levied by the state. More information is available from the Vermont Agency of Agriculture, the Division of Forestry, and the Department of Taxes, which administers the program.

- ing and proposed trail systems
- scenic features, including viewsheds, prominent peaks, and ridgelines
- cultural resources, including landscape features (stonewalls and cellar holes), archaeological and historical sites, structures, districts, and landscapes

The management plan should also identify allowed uses within different areas of the parcel, and accepted management techniques or practices for each use, as needed to protect or conserve identified resources. These may include:

- buffering requirements
- restrictions on the removal of vegetation
- accepted agricultural and logging practices
- road and trail construction and maintenance practices
- stormwater management and treatment practices
- erosion prevention and sedimentation control practices
- seasonal use limitations
- recreational use restrictions

Conservation Easements: Rights and Restrictions

Rights Typically Retained by Landowners	Restrictions Typically Placed on Properties
Engage in accepted farming practices	Further subdivision for development
Build barns, sheds, other farm structures	Commercial, industrial, or mining activities
Use, maintain, and expand an existing dwelling	New structures, except for those negotiated in advance
Manage woodlands for timber production	Commercial recreation (as required to obtain federal tax benefits)
Set aside land for one or more additional dwellings in agreed-upon areas or “building envelopes”	
Source: Adapted from <i>Using Conservation Easements to Preserve Open Space: A Guide for Pennsylvania Municipalities</i> , Heritage Conservancy (2002).	

Management plans can be prepared by volunteers, but often some professional assistance is needed. Technical assistance and grant programs are available through federal and state agencies and regional nonprofit organizations, depending on the types of resources to be identified and managed. For example, county foresters can help draft management plans for town forests. The Northern Forest Alliance's Town Forest Project is preparing, in association with the Vermont Department of Forests, Parks and Recreation and the University of Vermont, a town forest stewardship resource guide, scheduled for release in 2006. The Vermont Urban

and Community Forestry Program provides grants for the development of community forest management plans. The U.S. Natural Resource Conservation Service is also a good source of information for resource management systems (RMSs), which include sets of approved resource conservation practices commonly used in Vermont.

Once a management plan is in effect, it needs to be administered and enforced through an ongoing maintenance and monitoring program. This requires a long-term commitment on the part of the community or responsible organization, which may be beyond the capacity of smaller,

all-volunteer organizations.

Given available resources, local stewardship programs often focus on land or easements held by the community, but some community groups, nonprofit organizations, and state and federal agencies also actively work with private property owners interested in land conservation. A local stewardship program can provide information about available cost-sharing and technical assistance programs that support private land conservation and resource management. Local groups also can organize and supply volunteer labor for private conservation projects that have larger community benefits.

Municipal Forests

There are some 120 communities in Vermont that own a total of 140 municipal forests, together making up around 80,000 acres—a small fraction of the state's 4.6 million acres of forestland. Some have been formally designated as "municipal forests" by the Vermont Department of Forests, Parks and Recreation under state law (10 V.S.A. §2653); while others are tracts of forestland owned and managed by municipalities. Many municipal forests have existed for over a century; others date from the 1930s and 1940s, when the state was offering communities money to buy forestland.

A municipal forest, as defined by the state, is "a tract of land primarily devoted to producing wood products, maintaining wildlife habitat, protecting water supplies, providing forest recreation and conservation education." State municipal forest designation is

made by the commissioner of Forests, Parks and Recreation following an examination of the land by the department and a determination that the land is suitable for a municipal forest. Once designated, management of the municipal forest is under the direction of the commissioner. Forest protection is the responsibility of the local tree warden.

A municipality, at a legally warned meeting, may vote a sum of money for the purchase, management, and improvement of a municipal forest within or outside the municipality. Voted appropriations also qualify the municipality to apply for available state and federal matching funds, provided that the use of such funds is approved by the commissioner of Forests, Parks and Recreation. Matching funds not used for the purchase of land can be used in establishing multiple uses and implementing a management program for the municipal forest.

Municipal forests are managed for a

variety of uses, including timber sales, wildlife habitat, protection of public waters supplies, and, increasingly, for outdoor educational and recreational use.

The Vermont Town Forest Project, a statewide effort, is now underway to help Vermont communities establish and manage community forests. Organized through the Northern Forest Alliance, the project involves more than thirty program partners, including the Vermont Department of Forests, Parks and Recreation. The project is working with partner communities to:

- deepen local cultural and educational ties to community forests;
- help develop and implement strong forest stewardship plans and monitoring programs; and
- support community-led acquisition or expansion of local town forests.

For more information, contact the Northern Forest Alliance (www.northernforestalliance.org).