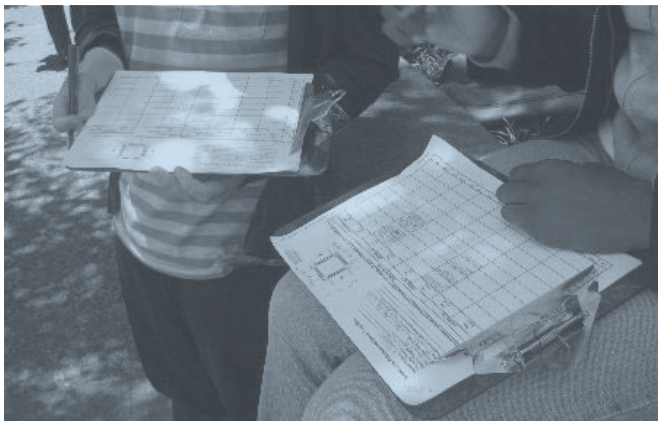
Pedestrian and Bicycle Count Program for the San Francisco Bay Region

APPENDICES



January 15, 2020

METROPOLITAN TRANSPORTATION COMMISSION

Prepared by:
PLACEWORKS

Appendices

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1-A

Best Practices Matrix

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Agency	Type of Counts	Description of Data Collected	Count Forms	Count Training Manuals	Count Location Selection	Day/Time/Duration for Non-Continuous Counts	Frequency for Non-Continuous Counts	Detrmining Factor Groups and Adjustment Factors
NBPD	**Focused on manual counts** **Screenline counts for bicyclists and pedestrians, as well as Intersection turning movement counts for bicycles**	Pedestrian and Bicycle Count bicyclists who ride on the sidewalk. Count the number of people on the bicycle, not the number of bicycles. Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc. People using equipment such as skateboards or rollerblades should be included in the "Other" category.	Manual count forms (screenline and intersection) Forms do not not include behavior factors, but guidelines provide potential suggestions on factors to include Data collection spreadsheet also available Extrapolation spreadsheet also available Available online	"Instructions" Manual Training presentation for count administrators Training presentation for count participants Available online	Ped/bike activity areas (downtowns, near schools, parks, etc.) Representative locations in urban, suburban, and rural locations Locations where counts have been conducted historically Locations where there are on-going counts being conducted by other agencies Gaps and pinch points for bikes/peds Locations where bike/ped collision numbers are high	Recommends 3 counts at each location on sequential days or weeks Weekday counts should be done Tuesday, Wednesday or Thursday; weekend counts either day Recommended times: •Weekday, 10am-noon and 5-7 pm • Saturday, 12 – 2pm Secondary Times: • Weekday 7am-7pm • Wknd, 7am-7pm	• Biannual • Sep & May • NBPD proposes the second week of Sep • Optional counts can be conducted in Jan, May and Jul to understand seasonal changes	NBPD provides adjustment factors for jurisdictions to use for multi-use paths and "high density pedestrian and entertainment areas"
NCHRP	**Manual and Automated** **Screenline counts for bicyclists and pedestrians, as well as Intersection turning movement counts for bicycles**	Pedestrian and Bicycle No specific guidance regarding behavioral characteristics. Evaluation of behavior patterns is discussed only in terms of indentifying factors that affect ped and bike activity.	None provided	None provided	Random locations: This approach may not capture strategic locations, nor select sites appropriate for automated counting. Selecting randomly from within categories of desired characteristics (stratified random sampling) is an alternative. Representative locations: This approach balances available resources with spatial coverage. Identified sites, in aggregate, are representative of the community as a whole. Targeted locations: Sites are selected on the basis of being associated with particular projects, facility types, or locations with particular characteristics (e.g., safety concerns). Control locations: This approach compares sites affected by a project with unaltered sites (control locations) to determine how much of the observed change in demand can be attributed to the project.	2 hours minimum - manual counts 4–7 days - automated counts Short-duration counts: Conduct several short counts during different time periods.	No specific guidance	"Adjusting Count Data"section discusses correction factors (for automated counts) and expansion factors (automated and manual). Extrapolate using a single day-of-year factor, rather than using day-of-week and month-of-year factors Approaches for Developing Factor Groups: •Visual comparison of volume patterns from continuous counts. •Statistical comparisons of volume ratios derived from continuous counts. •Applying criteria describing characteristics of interest (e.g., land uses) in selecting count locations to include in a given factor group.
FHWA	**Manual and Automated** **Screenline counts for bicyclists and pedestrians, as well as Intersection turning movement counts for bicycles**	Pedestrian and Bicycle No specific guidance regarding behavioral patterns.	None provided	None provided	Refers to NBPD criteria for locating short-duration counts Differentiate pedestrian and bicycle traffic when selecting locations Select locations that are most representative of prevailing nonmotorized traffic patterns Permanent count locations may be installed at low-use locations if higher use is expected after pedestrian or bicycle facility construction 3-5 continuous count locations for each distinct factor group Provides guidance on physical placement of automated equipment at the count site	Short Duration - Manual: Minimum 4-6 hours recommended to coincide with the heaviest nonmotorized use (typically mid-day for weekend/recreational trips and morning/evening commute times for other trips) Automated: 7 days minimum, up to 14 days	Refers to NBPD (Biannual: May & Sep)	Pattern groups (factor groups) based on times of the year when counts are conducted (e.g., winter, spring,summer) and use categories defined as: commuter and work/school-based trips, recreational/utilitarian trips, and mixed trips Recommend 5 continuous counters per factor group

Agency	Type of Counts	Description of Data Collected	Count Forms	Count Training Manuals	Count Location Selection	Day/Time/Duration for Non-Continuous Counts	Frequency for Non-Continuous Counts	Detrmining Factor Groups and Adjustment Factors
Portland State University Initiative for Bicycle and Pedestrian Innovation	**Manual and Automated**	Pedestrian and Bicycle Follows count protocols as recommended by FHWA (primarily) and NBPD (secondarily)	No count forms Permanent and Short-Duration Count Program Checklists available	N/A	Follows count protocols as recommended by FHWA (primarily) and NBPD (secondarily) No further guidance	Short-duration counts: 7 days recommended, 24-hrs minimum (requiring automated methods), but 2 hrs still usable	Follows count protocols as recommended by FHWA (primarily) and NBPD (secondarily) No further guidance	Yes, Factor groups (Annualizing short-duration counts)
Colorado DOT	**Automated and Big Data (Strava Metro)**	Pedestrian and Bicycle	none available	none available	No guidance	Automated counts: • At least 7 days of counts is most cost-effective length • Short term counts sould be conducted between May and October. August and September are best • Avoid doing counts on special event days or days of extreme weather	No guidance	CDOT has established methods for annualizing bicycle counts; the first is based directly on methods proposed by FHWA in the Traffic Management Guide, and the second is based on a method developed using peak-hour factors from City of Boulder bicycle count data. CDOT has determined state-wide as well as region-specific factor groups. In many state locations, two factor groups are identified: those with clear commute patterns and those without. Regional factor groups include “trail “, “utilitarian”, and “recreational” factor groups. "Dev't of Estimation Methodology" document recommends at least 7 permanent county stations per factor group. Daily weather data sufficient for estimating the annual average of daily bicyclists.
Minnesota DOT	**Manual and Automated**	Pedestrian and Bicycle Behavioral characteristics counted during manual counts	MNDOT Standard Manual Screenline Count Form	N/A	BASED ON NCHRP but adds "Index locations" Random locations: See NCHRP description Representative locations: See NCHRP description Targeted locations: See NCHRP description Control locations: See NCHRP description Index locations. Index locations are illustrative of the counts statewide. These sites are not fully representative or inclusive of every roadway nor are they a statistically random sample. MnDOT is using this approach for establishing statewide trends.	Follows count protocols as recommended by NBPD, FHWA and NCHRP, Short-duration manual counts: • Three successive evenings (T-W-Th) are recommended from 4 pm to 6 or 7 pm • One Saturday from 10 am to noon or 2 pm	Follows count protocols as recommended by NBPD, FHWA and NCHRP	Provides adjustment factors based on City of Minneapolis data Describes day-of-year factoring approaches

Agency	Type of Counts	Description of Data Collected	Count Forms	Count Training Manuals	Count Location Selection	Day/Time/Duration for Non-Continuous Counts	Frequency for Non-Continuous Counts	Detrmining Factor Groups and Adjustment Factors
Washington State DOT	**Manual and Automated**	Pedestrian and Bicycle	N/A	N/A	Generally, bases protocols on NBPD guidance but provides a greater level of specificity customized to the state. • 30 counts sites for every 100 centerline miles of roadway • Arterials and expressways • Local roads and collectors • Shared use path or trail • Recommends 3-5 locations per factor group for continuous sites	Manual: •Wkdy (choose T,W, or Th) 7-9 am; 11am – 1pm; 4-6 pm • Wknd (Saturday) – 12-2pm Automated: refers to *Traffic Monitoring Guide* recommendations from FHWA (minimum 1 week (7 days) per site, with 14 days preferred	• Small communities- every third year (so 10/year per 100 centerline miles) •Large communities – every third year each location (so ~165/year, likely divided into spring, summer and fall) and then counts would be annualized based on factor groups	The guidebook provides seasonal, daily and hourly adjustment factors that count administrators can used to account for temporal variation.
Delaware Valley Regional Planning Commission	**Automated Pedestrian and Bicycle Counts and Smartphone-Based Bicycle App ("CyclePhilly")**	Pedestrian and Bicycle	N/A	N/A	12 locations along circuit trails around the region	24-hours per day, 365-days per year	FY2015, will be starting a Cyclical Bike Count Program, strategically counting bikes for one week in representative locations around the region on a regular basis.	N/A
SCAG	**Manual and Automated** **Screenline counts for bicyclists and pedestrians, as well as Intersection turning movement counts for bicycles**	Pedestrian and Bicycle General guidance: • Count bicyclists who ride on the sidewalk. • Count the number of people on the bicycle, not the number of bicycles. • Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc. • People using equipment such as skateboards or rollerblades should be included in the "Other" category. Behavioral/Demographic characteristics: •People using wheelchairs or other special needs •Bicyclists riding on the sidewalk •Bicyclists riding the wrong way on the street •Female bicyclists •Children on bicycles •Bicyclists not wearing helmets •Specific age groups	Yes (NBPD and Berkeley SafeTREC forms are in the appendix) Additional forms: •Screenline Supervisor Form •Bicycle Parking Counts •Bicycles on Transit Count Form	Yes "Conducting Bicycle and Pedestrian Counts: A Manual for Jurisdictions in Los Angeles County and Beyond" (2013)	Destinations that attract bicyclists and pedestrians: Schools, downtown, major retail or employment areas, high density residential areas, civic uses, and major transit stations or stops are some examples Public facilities for non-motorized travel: On-street bikeways (particularly where there are limited choices for parallel routes), trails, pedestrian and bicycle bridges Specific locations where there is already a history of non-motorized counts, collisions involving pedestrians or bicyclists, or planned facilities for non-motorized travel Locations where new bicycle and pedestrian facilities are planned, so that before and after counts may be conducted If resources are limited, focus on locations where you expect to observe high bicycle volumes. When choosing locations, you must consider whether you want to do an intersection or a screenline count.	Recommended for each manual count location: •3 consecutive counts from 7-9am on a weekday •3 consecutive counts from 4-6pm on a weekday •1 count from 11am-1pm on a non-holiday weekend day Minimum: • 2 count periods from 7-9 am on wkdy • 2 count periods from 4-6 pm on wkdy • 1 count period from 11a-1pm on a non-holiday wknd Tue, Wed, Thu are best weekdays Saturday is best for weekend counts Take count during academic school year	Quarterly count efforts are recommended Ideally to coincide with dates suggested by National Bicycle and Pedestrian Documentation Project Conduct same month each year Minumum: Once per year	Some discussion but no specific guidance

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NBPD Count Forms

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STANDARD SCREENLINE COUNT FORM

Name: _____ Location: _____

Date: _____ Start Time: _____ End Time: _____

Weather: _____

Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). Count all bicyclists and pedestrians crossing your screen line under the appropriate categories.

- Count for two hours in 15 minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc.
- People using equipment such as skateboards or rollerblades should be included in the "Other" category.

	Bicycles		Pedestrians		Others
	Female	Male	Female	Male	
00-:15					
15-:30					
30-:45					
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total					

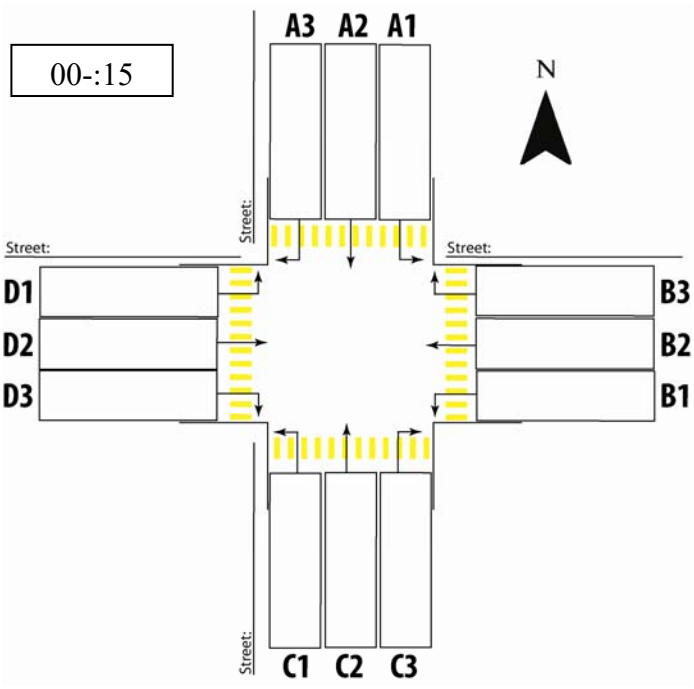
STANDARD BICYCLE INTERSECTION COUNT FORM

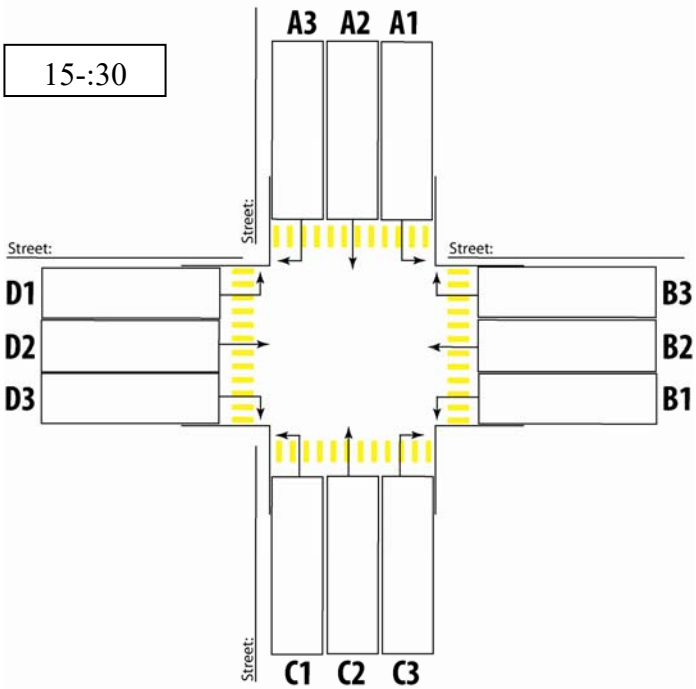
Name: _____ Location: _____

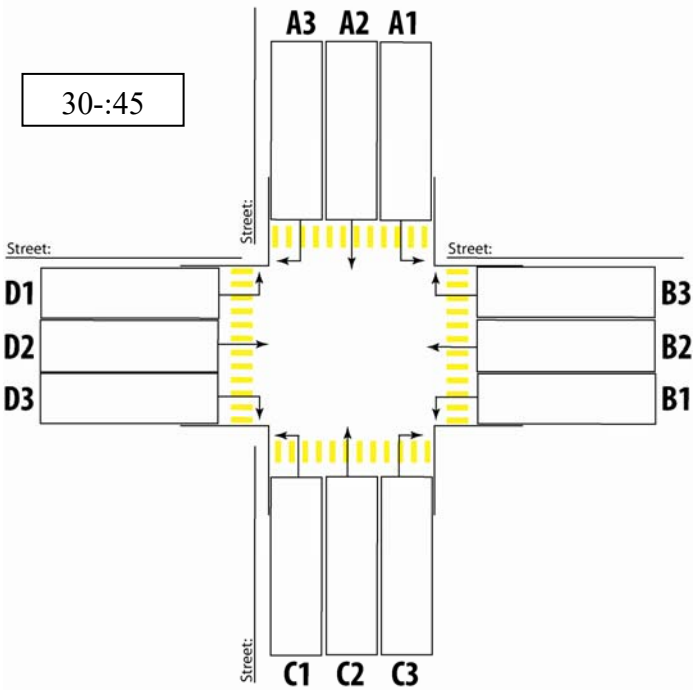
Date: _____ Start Time: _____ End Time: _____
Weather: _____

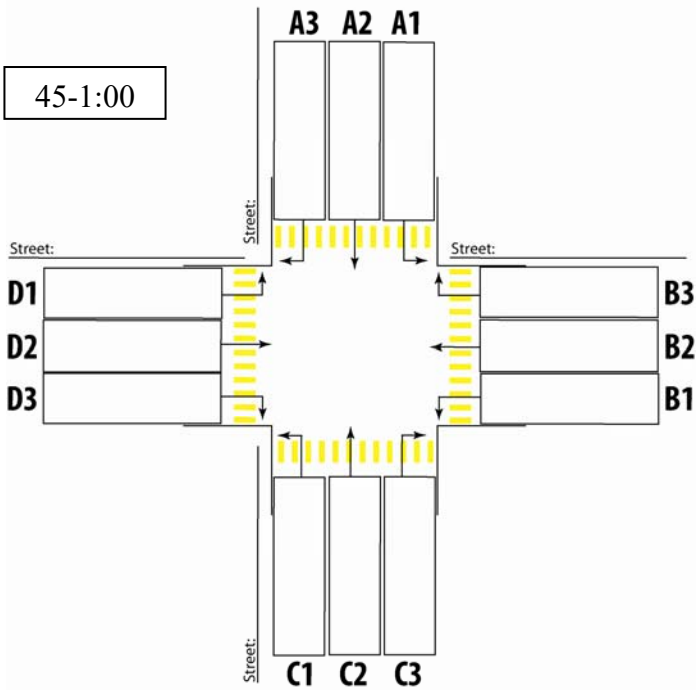
Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). Count all bicyclists crossing through the intersection under the appropriate categories.

- Count for two hours in 15-minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Use one intersection graphic per 15-minute interval.









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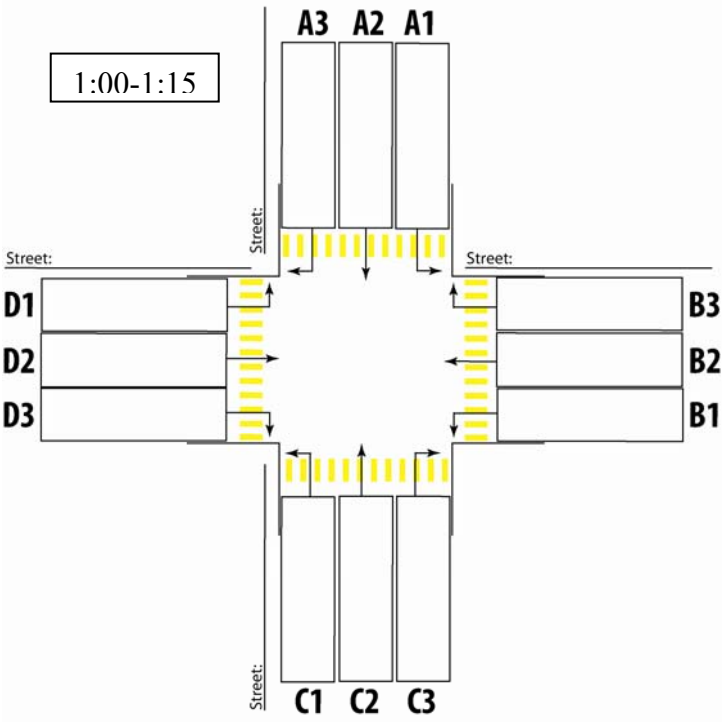

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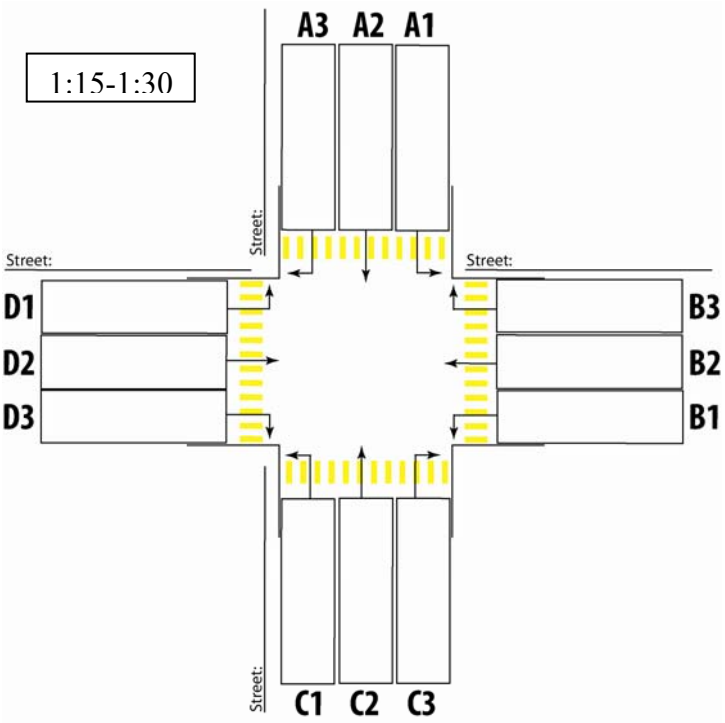

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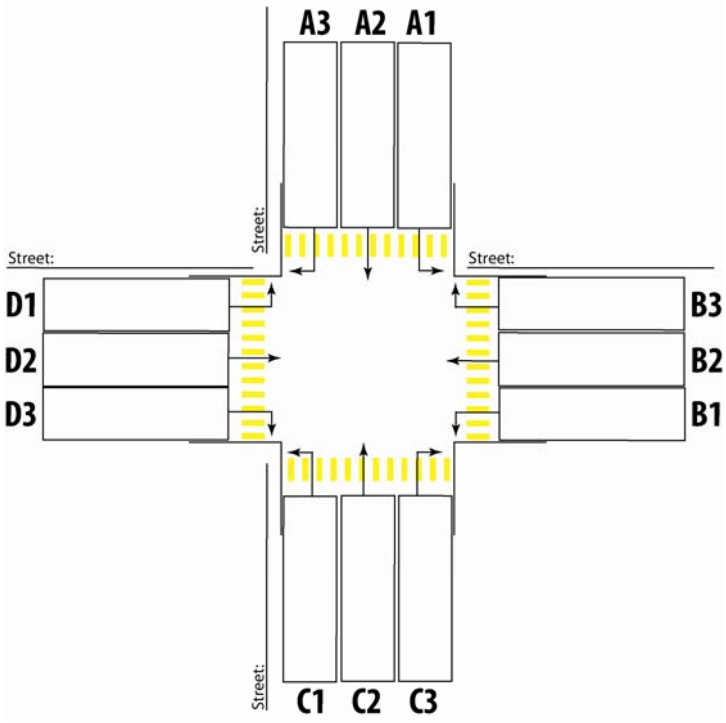
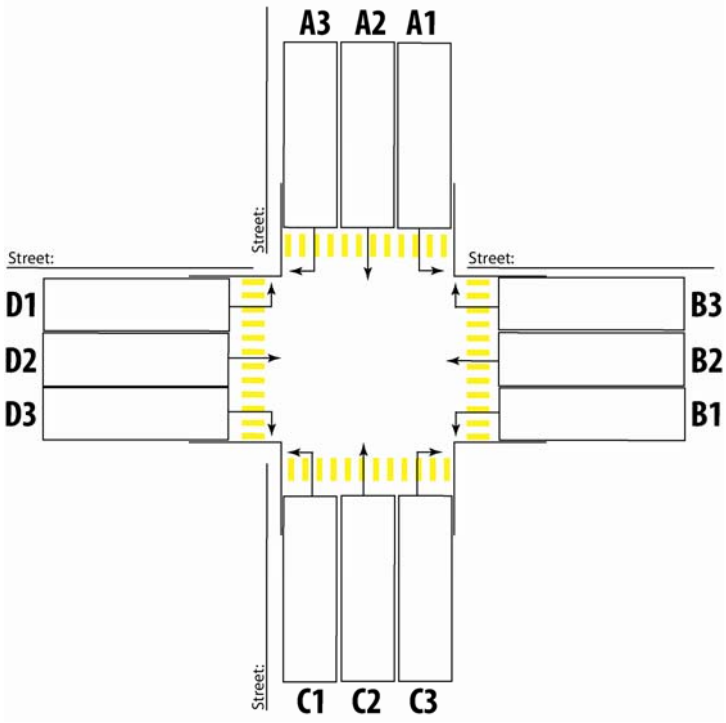


1:45-2:00



Notes:

STANDARD BICYCLE INTERSECTION COUNT TALLY SHEET

	Bicycle Counts										
Time Period	Leaving Leg A			Leaving Leg B			Leaving Leg C			Leaving Leg D	
	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3
00-:15												
15-:30												
30-:45												
45-1:00												
1:00-1:15												
1:15-1:30												
1:30-1:45												
1:45-2:00												
Total												
Total Leg:												

Street Name A to C: **Location 1 (Total Leg A + Total Leg C) =**

Street Name B to D: **Location 2 (Total Leg B + Total Leg D) =**

1-C

NBPD Pedestrian and Bicycle Count Guidelines

Image: Jeremy Brooks/Flilckr

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National Bicycle and Pedestrian Documentation Project: Instructions

The National Documentation Project (NBPD) is an annual bicycle and pedestrian count and survey effort sponsored by the Institute of Transportation Engineers Pedestrian and Bicycle Council. The goals of the NBPD are to: (1) Establish a consistent national bicycle and pedestrian count and survey methodology;(2) Establish a national database of bicycle and pedestrian count information generated by these consistent methods and practices; and (3) Use the count and survey information to begin analysis on the correlations between local demographic, climate and land-use factors and bicycle and pedestrian activity.

Alta Planning + Design, a national bicycle and pedestrian planning firm, initiated this effort through the ITE Pedestrian & Bicycle Council in 2003, when it was identified as a priority for the Council and will continue to lead this effort along with the ITE Pedestrian and Bicycle Council. Alta has been responsible for the development of the draft methodology and materials.

This document is a draft effort and any recommendations, corrections or suggestions can be addressed to the National Bicycle and Pedestrian Project at:
info@bikepeddocumentation.org

Table of Contents

Introduction

This document provides detailed instructions on conducting bicycle and pedestrian counts and surveys as part of the National Documentation Project. The document first reviews the proposed dates and times, provides instructions for counts and then provides instructions for surveys.

1. Proposed Count and Survey Dates and Times

Dates

The second week in September is proposed as the official annual national bicycle and pedestrian count and survey week. Participants in the National Documentation Project shall pick at least one weekday (Tuesday, Wednesday, or Thursday) and a Saturday following or preceding the official count dates. Optional counts can be conducted in January, May and July to understand seasonal changes in walking and cycling.

Proposed National Count Dates

Official	Optional	Optional	Optional
Sept. 14-16, 2010	January 12-14, 2010	May 11-13, 2010	July 6-8, 2010
Sept. 13-15, 2011	January 11-13, 2011	May 10-12, 2011	July 5-7, 2011
Sept. 11-13, 2012	January 10-12, 2012	May 15-17, 2012	July 3-5, 2012

To reduce the chance that data is skewed by weather, sports events, or other outside factors, local participants may choose to conduct counts and surveys on more than one weekday during the count week and on the Saturdays preceding and following the count week.

Note 1: The collection of year-long data has allowed us to be able to adjust counts done at any time of the year in most locations. However, we recommend using the National count dates whenever possible.

Note 2: If your agency or group has been conducting counts at other times of the year, continue to do those counts at the same time period rather than change to these dates.

Rationale for Dates

The National Count Date in mid-September was selected because it represents a peak period for walking and bicycling, both work- and school-related. Weather conditions across the country are generally conducive, schools have been underway for several weeks, and people have returned from vacations and are back at work.

At least one weekday and one weekend day should be selected to obtain a sampling of weekday and weekend activity levels. There should be little statistical difference

between counts conducted on a Tuesday, Wednesday, or Thursday of the same week, and this provides agencies and organizations some scheduling flexibility.

The other dates were selected to provide a representative sampling of activity during a typical spring (May) and winter (January) period. The 4th of July period was selected because it will afford both a typical summer weekday and what is typically the busiest holiday period and activity period for recreational facilities and activities.

Having an official count week is also important for generating enthusiasm around the date. Much like nationwide Bike to Work Weeks, we hope that the National Documentation Project Week in September will become a much-anticipated annual event in localities around the nation.

Times

Based on our research, we are recommending new time periods for 2009 onwards (see below). However, if you have been doing counts using the old time periods, please keep using these same time periods for all future counts in order to be consistent.

RECOMMENDED TIMES:
Weekday, 5-7 PM
Saturday, 12 noon – 2PM

SECONDARY TIMES:
Weekday, 7 AM to 7 PM
Saturday, 7 AM to 7 PM

Rationale for Time Periods

Time periods are more important for counts than for surveys. Weekday PM peak periods were chosen since the afternoon peak typically has the largest volume of travelers, with commuters, school children and people running errands. Counts conducted during these periods will provide an excellent snapshot of walking and bicycling during the peak periods of the year. Mid-day weekend periods are another peak period. Actual local peak periods may vary with considerably. It is recommended that the national count time periods be collected along with supplementary time periods if it is determined that this period captures the true peak period of activity.

Automatic Machines

While the NBPD is based on manual counts, we strongly encourage agencies and groups conducting counts to consider conducting automatic machine counts in their community. These machines will give invaluable information for estimating annual usage, benefits and other information.

Weather

Weather may be a determinant in selecting one of the three proposed weekdays to conduct counts and surveys, but a participant should not be worried if the weather is poor or unusual during the count period. Weather conditions will be recorded for each

count in the Background Data Sheet and be considered as a factor in future analysis. Over time, counts and surveys will average out and overall trends in activity will become apparent.

Number of Counts per Location

We suggest that between 1 and 3 counts be conducted at every location on sequential days and weeks, based on the approximate levels of activity. Areas with high volumes (over 100 people per hour during mid-day periods) can usually be counted once on a weekday and weekend day, unless there is some unusual activity that day or land use nearby.

Areas with lower activity levels and/or with unusual nearby land uses (with any irregular activity, such as a ball park) or activity (such as a special event) should be counted on sequential days or weeks at least one more and possibly two more times.

2. Counts

2.1 Count Methodology

Count Variables

The proposed counts are intended to identify the numbers of bicyclists and pedestrians passing a specific point or intersection. A person who passes by a point more than once is counted each time they pass by the point. Localities may wish to record additional variables in addition to the number of people passing by, such as bicyclists versus pedestrians, the number of people using wheelchairs or the estimated number of children, teens and adults.

Number of Count Locations

In the interest of maximizing participation, a minimum number of count locations has not been set for the NBPD. Participants may submit data for a single location. However, to understand walking and cycling in a local area, we recommend that participants count at more than one location.

Should an agency wish to conduct more counts, which is recommended, we estimated that, at a minimum, one count should be conducted per 15,000 of population. This was considered a reasonable balance between obtaining representative counts throughout a community, and budget limitations.

Count Location Criteria

Criteria for count and survey locations include:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.)
- Representative locations in urban, suburban, and rural locations
- Key corridors that can be used to gauge the impacts of future improvements
- Locations where counts have been conducted historically
- Locations where there are on-going counts being conducted by other agencies through a variety of means, including video taping
- Gaps and pinch points for bicyclists and pedestrians (potential improvement areas)
- Locations where bicycle and pedestrian collision numbers are high
- Select locations that meet as many of the criteria as possible.

It is important to note that a random selection of locations is statistically the best way to estimate area-wide activity levels. However, there is no methodology available today to

extrapolate from counts to area-wide estimates—which is currently done using a combination of aggregate-type models. More importantly, a random selection of count locations is likely to result in locations with very little if any activity to count!

Screen Line and Intersection Crossing Counts

The National Count periods are proposed to be manual screen line and intersection crossing counts, conducted by trained counters.

Intersection crossing counts should be conducted at high collision locations and where safety studies are desired. Depending on the volumes of bicyclists and pedestrians, intersection counts may be more complicated and require additional counters because they record two streets as well as turning movements.

Screen line counts are primarily used to identify general trends in volumes, and to see how demographics, land use, and other factors influence walking and bicycling.

The sponsoring agency should determine which method, intersection crossing counts or screenline counts, is better suited to their needs such as safety studies or determining factors that influence walking and bicycling.

2.2 Pre-Count Preparation

To ensure that data received from different participants is comparable and consistent, participants should agree to follow the instructions and guidelines identified below:

STEP 1: IDENTIFY COUNT MANAGER

An agency or organization interested in participating in this process will designate a Count Manager who will serve as the primary contact and manager of the count effort. Because this effort will require time and other resources, prior approval should be obtained prior to embarking on this effort. It is estimated that the lead person will need approximately 8 initial hours of management time and 1 hour of management time for every 8 hours of count time being conducted.

STEP 2: OBTAIN MATERIALS

Count forms and the Background Data Sheet are available from the National Bicycle and Pedestrian Documentation Project website at: www.bikepeddocumentation.org. The Count Manager should check the website to ensure that s/he has the latest versions of the Count Instructions and Forms. Materials can be reproduced freely. The documents provided are:

- Count Instructions (This document)

Included in “National Bicycle and Pedestrian Documentation Project: Forms”:

- Screenline Count Forms

- Intersection Count Forms
- Background Data Sheet
- Background Data Sheet Code and Instructions

STEP 3: SELECT GENERAL COUNT LOCATIONS

Participants may count at only one location, or they may conduct counts at many locations. The following considerations and suggested criteria are provided to help in the selection of general count locations:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.)
- Representative locations in urban, suburban, and rural locations
- Key corridors that can be used to gauge the impacts of future improvements
- Locations where counts have been conducted historically
- Locations where there are on-going counts being conducted by other agencies through a variety of means, including video taping
- Gaps and pinch points for bicyclists and pedestrians (potential improvement areas)
- Locations where bicycle and pedestrian collision numbers are high
- Select locations that meet as many of the criteria as possible.

STEP 4: SELECT SPECIFIC COUNT LOCATIONS

Once general locations have been selected, the Count Manager will need to inspect the sites to determine exactly where counters can be positioned. Guidelines for this inspection trip include:

- For multi-use paths and parks, locations near the major access points are best.
- For on-street bikeways, locations where there are few if any alternative parallel routes are best.
- For traditional downtown areas, a location near a transit stop or in the center of downtown is best.
- For shopping malls, a location near the main entrance and transit stop is best. Count at one access point.
- For employment areas, either on the main access roadway or near off-street multiuse paths is best. Count at one access point, typically a sidewalk and street.
- For residential areas, locations near higher density developments or near parks and schools are the best. Count at one access point, typically a sidewalk and street.

For all locations:

- Counts should include travel in both directions.
- Counters will need to be in a safe, visible location and should be on public property in a location that does not block pedestrians or bicyclists.
- You must receive written permission from property owners if you will be on private property.
- If at all possible locate the counters in an area that will be comfortable for them: shade in the summer, protection from the wind in winter.

Rationale for Locations

The recommended locations are based on finding places where bicyclists and pedestrians can be expected to be counted, either now or after improvements have been made. The purpose of the counts is to understand peak bicycle and pedestrian activity on a typical day; while it may be useful to conduct a few counts where pedestrians and cyclists are not expected, it is preferable to understand existing use.

STEP 5: COMPLETE THE BACKGROUND SHEET

This sheet will provide valuable information on the setting and conditions in which the counts take place. Researchers will be able to cross-tabulate things such as usage with land use, density, weather, income, and the survey results. If conducting annual surveys, background data from prior counts should be updated if necessary.

Use the 'Background Data Sheet', available in "National Documentation Project: Forms" to record characteristics of the count locations. A detailed description of each of the background items is provided in the document "National Documentation Project: Forms."

STEP 6: OBTAIN COUNTERS

Each location should require one counter, unless you have selected an extremely busy downtown intersection. You will want to identify and secure a counter for each location plus one backup counter for every 5 locations. Counters can be agency employees, temporary employees, students, volunteers, or a professional data collection firm. You may need to secure insurance coverage for counters, or have them sign a waiver indemnifying your organization.

STEP 7: TRAIN COUNTERS

Counters will need to be trained how to complete forms and interpret field conditions. Trainings can be conducted prior to count times, with a follow-up briefing in the field prior to the actual count times. Counters need to be instructed how to respond to questions from the public on their activities. They should also be instructed on how to fill out the count form, how to count people (specifically, every time a person passes by) and what not to count.

2.3 The Day of the Count

STEP 8: COUNTER EQUIPMENT

All counters should be provided high visibility jerseys, along with name tags identifying the agency/organization they are working for. They should be provided business cards of the lead contact. They should also be provided clip boards and pens, and have a functioning watch. Emergency contact information should be provided for counters. Counts in hot, cold or inclement weather, counters should be provided folding chairs, water, umbrellas (as needed). In very busy areas, a manual clicker may help counters take more accurate counts.

STEP 9: COUNT FORMS

Distribute count forms to counters. Count forms can be reproduced from the document "National Documentation Project: Forms" available on the National Bicycle and Pedestrian Documentation project website: www.bikepeddocumentation.org.

STEP 10: TRANSPORTING AND MANAGING COUNTERS

Counters will need to arrive at the count locations at least 15 minutes ahead of schedule. The count manager should visit each count location to ensure that counters are on schedule. If the count locations are numerous or dispersed, designated supervisors may be needed to visit locations. Counters working in excess of 2 hours will need to be relieved for restroom breaks at least every 2 hours, and 30 minutes for lunch periods.

STEP 11: QUALITY CONTROL

The Count Manager and any location supervisors should conduct a random review of counters during the count period to ensure they are on-duty and tabulating information correctly. Count results that either varies significantly from one time period to the next or that are unusually consistent may need to be explained sufficiently to the Count Manager's satisfaction, or discarded.

STEP 12: COLLECTING FORMS

All forms should be collected by the Count Manager at the conclusion of the count period. The Count Manager should double-check to ensure that the count forms have been completed accurately.

2.4 Submitting Count Data

STEP 13: SUBMITTING DATA

Completed count forms should be reviewed for accuracy and legibility. Any illegible forms should be copied neatly to a fresh count form. After forms are completed they can be submitted along with each location's Background Data Sheet, to data@bikepeddocumentation.org. Participants should keep copies of their forms.

Completed counts can also be entered on the Data Sheet available at www.bikepeddocumentation.org and then submitted to data@bikepeddocumentation.org. Intersection crossing counts should be entered as two locations. See the count forms for tally instructions.

3. SURVEYS

3.1 Survey Methodology

Types of Surveys

There are numerous ways to conduct surveys or questionnaires, including phone interviews, insertion questionnaires into utility bills and paychecks, newsletters, web sites, and in field interviews. The proposed system for this survey is random interviews in the field. This approach will yield the best cross section of a community and higher quality information than any other approach. Phone interviews and other approaches will have a significant bias in the sampling group, since entire groups may be under represented. Additionally, in person interviews will provide details on the person being interviewed that other approaches will not allow.

Surveys are more difficult to administer and more likely to have biased results than counts. In part this is due to the fact that surveyors interact with the person being surveyed and can subconsciously influence the outcome. With counts, observers do not generally interact with the people being counted, and thus have less of a chance to subconsciously influence the outcome. With surveys, the surveyor's choice of who to ask, the surveyor's wording of the questions, and language barriers between the surveyor and the survey taker can bias results. The instructions below serve as a basic guideline for conducting bicycle and pedestrian surveys.

Surveys or questionnaires should be administered during the same general time period (within 3 weeks) as the counts. Step-by-step instructions for performing the surveys are presented below.

3.2 Pre-Survey Preparation

STEP 1: IDENTIFY SURVEY MANAGER

An agency or organization interested in participating in this process will designate a lead person who will serve as the primary contact and manager of the survey effort. Because this effort will require time and other resources, prior approval should be obtained prior to embarking on this effort. It is estimated that the Survey Manager will need approximately 8 initial hours of management and an additional 1 hour of management time for every 2 hours of survey time being conducted.

STEP 2: DOWNLOAD MATERIALS

Survey forms and the Background Data Sheet are available from the National Bicycle and Pedestrian website at: www.bikepeddocumentation.org. The Survey Manager should check the website to ensure that s/he has the latest versions of the Survey Instructions and Forms. Materials can be reproduced freely. The documents provided are:

- Survey Instructions (This document)

Included in "National Bicycle and Pedestrian Documentation Project: Forms":
- Standardized Survey Forms
- Survey Tabulation Forms
- Background Data Sheet
- Background Data Sheet Code and Instructions

STEP 3: SELECT GENERAL SURVEY LOCATIONS

There are two types of surveys: Pedestrian and Bicycle. There are no minimum or maximum number of survey locations that participants need to conduct, but if possible conduct the surveys in the same location as the counts. The following considerations and suggested criteria are provided to help in the selection of general survey locations:

- Pedestrian and bicycle activity areas or corridors
- Representative locations in urban, suburban, and rural locations
- Key corridors that can be used to gauge the impacts of future improvements
- Locations where surveys have been conducted historically
- Locations where bicycle and pedestrian collision numbers are high
- Locations where there are on-going surveys being conducted
- Gaps and pinch points for bicyclists and pedestrians

STEP 4: SELECT SPECIFIC SURVEY LOCATIONS

Once general locations have been selected, the Survey Manager will need to inspect the sites to determine exactly where surveyors can be positioned. Guidelines for this inspection trip include:

Path Survey

1. For multi-use paths, locations near the major access points are best.

On-Street Bikeway Survey

1. For on-street bikeways, locations at signalized intersections or bicycle parking areas are best.
2. Alternatively, bicyclists could be interviewed at their end points, such as work, shopping, or other areas.

Sidewalk Surveys

1. For traditional downtown areas, a location near the center of the downtown is best.
2. For shopping malls, a location near the main entrance and transit stop is best.
3. For employment areas, either on the main access roadway or near an off-street multiuse path is best.
4. For residential areas, locations near higher density developments or near parks and schools are the best.

For all locations:

Surveyors will need to be in a safe, visible location and on public property. You may be able to get permission to conduct surveys on private property such as a mall or major employer. Locations should provide shade and seating for surveyors.

Rationale for Locations

The recommended locations are based on finding places where bicyclists and pedestrians can be expected to congregate, either now or after improvements have been made. There is little point in conducting surveys in locations where pedestrians and bicyclists are almost non-existent.

STEP 5: COMPLETE THE BACKGROUND SHEET

This sheet will provide valuable information on the setting and conditions in which the surveys take place. Researchers will be able to cross-tabulate things such as usage with land use, density, weather, income, setting, trip purpose, and the survey results. If you have already done this for the counts, simply add the information under Surveys. If conducting annual surveys, background data from prior counts should be updated if necessary.

Use the 'Background Data Sheet', available in "National Documentation Project: Forms" to record characteristics of the survey locations. A detailed description of each of the background items is provided in the document "National Documentation Project: Forms."

STEP 6: OBTAIN SURVEYORS

Each location should require two surveyors, unless you have selected an extremely busy location in which case, more surveyors will be needed. You will want to identify and secure two surveyors for each location plus one backup counter for every 5 locations. Surveyors can be agency employees, temporary help, students, volunteers, or a professional data collection firm. You may need to secure insurance coverage for surveyors, or have them sign a waiver indemnifying your organization.

STEP 7: TRAIN SURVEY TAKERS

Surveyors will need to be trained carefully, since the general public is reluctant to be stopped and questioned. The surveys are designed to be completed in less than five minutes. The surveyor should be warned not to be aggressive and respect people's wishes not to be bothered. The ideal surveyor is a person who can speak clearly, is somewhat outgoing, and presents him or herself well. It is best if surveyors live or work in the neighborhood in which the surveys are being conducted. Surveyors need to be able to ask questions and write responses at the same time. Bilingual speakers may be needed in some locations.

Surveyors should ask the following question as people approach:

> "Hello, do you have time to answer a few questions about walking and biking?"
>
> If yes:
>
> "My name is _____ and I'm conducting this survey for _____. The information will be used to better understand why people walk and bike where they do. The survey will take about 5 minutes.
>
> "You don't have to answer all the questions, and you can stop taking the survey at any time. I won't ask for any personal information. Would you like to take the survey?

In an area where residents primarily speak another language besides English, survey takers should ask the above question in the appropriate language, and survey forms should be translated into the appropriate language.

To reduce bias inherent in surveying, the Survey Manager should create a methodology for randomly sampling passing pedestrians and cyclists. This could be to ask every single pedestrian and cyclist, or in areas with a lot of traffic, this could be to ask every third or fifth passing pedestrian or cyclist. The important part is to keep it consistent. If a person asks to take the survey, you should let them, but their data should not be counted as it can potentially bias the results. In all cases, surveyors should keep track of the number of people they asked to take the survey so that a refusal rate can be calculated.

To ensure accuracy of the data, surveyors should fill out the form for the survey taker.

Surveyors should be given answers to a list of anticipated questions and trained to refer all other questions to the Survey Manager. Surveyors should have copies of the Survey Manager's business cards on hand.

3.3 Day of the Survey

STEP 8: SURVEY TAKER EQUIPMENT

Survey takers will need to have a clear identification badge and color jersey. A simple sign measuring 2 feet by 2 feet may be placed at the survey location that reads: SURVEY ON PUBLIC USE IN PROGRESS: [AGENCY OR ORGANIZATION NAME].

Survey takers will need to have a method of recording the number of people they asked to calculate the refusal rate. This could be a clipboard and tick marks or a hand held clicker.

STEP 9: SURVEY FORMS

Distribute survey forms to counters. Reproduce survey forms from the appendix materials.

STEP 10: TRANSPORTING AND MANAGING SURVEY TAKERS

Survey takers will need to be driven to the survey locations and arrive at least 15 minutes ahead of schedule. Survey takers working in excess of 2 hours will need to be relieved for restroom breaks at least every 2 hours, and 30 minutes for lunch periods.

STEP 11: QUALITY CONTROL

The Survey Manager should conduct a random review of survey takers during the survey period to ensure they are on-duty and tabulating information correctly. Survey results that either varies significantly from one time period to the next, or that are unusually consistent, may need to be explained sufficiently to the Survey Manager's satisfaction, or discarded.

3.4 Post-Survey Data Tabulation and Submission

STEP 12: COLLECTING FORMS

All forms should be collected by the Survey Manager at the conclusion of the survey period. The Survey Manager should double-check to ensure that the survey forms have been completed accurately.

STEP 13: TABULATING DATA

Once the survey forms are collected, they need to be tabulated. A Survey Tabulation Form and detailed instructions are available at www.bikepeddocumentation.org

STEP 14: SUBMITTING DATA

Please submit the completed Survey Tabulation Forms and Background Data Sheet for each location to data@bikepeddocumentation.org.

1-D

Portland State University Count Program Checklist

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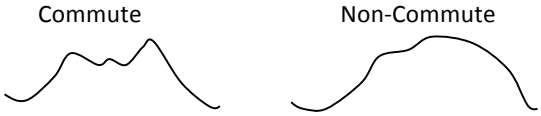
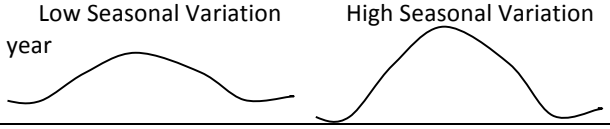
Permanent Count Program Checklist	Done?
1&2. **Review the existing program and create an inventory.** Make sure to ask around! Reach out to parks departments, business districts, and health departments. All are potential data collectors. • Where are they? • What are they counting? • What technology do they use? • How long have they been counting there? • Have they evaluated accuracy? QA/QC the data. For example, count bikes/peds for 1 or 2 peak hours and compare to the automated counts[1]. Compute a correction factor (actual /automated count) to account for under or overcounting. Also, check for unusually high counts and suspect zero counts.	
3. **Look at the data. What patterns do you see?** Plot the patterns over the day  Plot the patterns over the week  Plot the average counts over the year 	
4. **Group count stations by pattern.** For example, commute, non-commute, mixed.	
5. **Do you have enough count stations?** Are there any patterns you expected to see but didn't? Are all regions represented? Do you have at least 3 stations per group? If you answer "no" to any of these questions, consider installing additional count stations.	
6**. Select locations for additional count stations, if needed.** Develop selection criteria and a data collection plan. (see TMG Chapter 2)	
7**. Compute monthly, day-of-week, and hour-of-day (if applicable) factors to use in annualizing short duration counts.** In the absence of a full set of counters: 1. Use whatever accurate permanent count datasets you have to create factors. 2. If you have no permanent count data, check with your state or region. 3. If you find no data or factors, use the NBPDP[2] factors for now, and install one or more permanent counters soon.	

Short-Duration Count Program Checklist	Done?
1. **Select Count Locations**	
2. **Select Intersection vs. Segment** (aka screenline) **Count** and Counter Technology	
3. **Select Count Duration** (7-days recommended, 24-hrs minimum, but 2-hrs still usable)	
4. **Schedule Counts** (Choose months with high bike/ped traffic.[3])	
5. **Annualize Short-duration Counts** by applying factors from Step 7 above. For example: Annual Average Daily Bicyclists = (24-hr Count) X (Daily Factor) X (Monthly Factor)	

For more details see Chapter 4 of the Traffic Monitoring Guide (TMG) 2013. The steps numbered above match TMG steps. http://www.fhwa.dot.gov/policyinformation/tmguide/

[1] Observe at least 100 bicyclists or pedestrians. For sites with high to medium volumes this can be done in 1 or 2 hours.
[2] The National Bicycle and Pedestrian Documentation Project (NBPDP) posts information on manual counting programs and generalized factors. http://bikepeddocumentation.org/
[3] If less than a full week is counted, Tuesdays through Thursdays are recommended.

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1-E

Southern California Association of Governments (SCAG) Count Forms

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ACTIVE TRANSPORTATION LOCATION COVER SHEET

COUNTER NAME _____

STUDY NAME _____

PAGES _____ PAGE OF _____ TOTAL

COUNT START/END _____ : AM PM START _____ : AM PM END

LOCATION _____ STREET PATH

DATE _____ DAY _____ MONTH 20 _____ YEAR

INTERVAL LENGTH _____ MIN

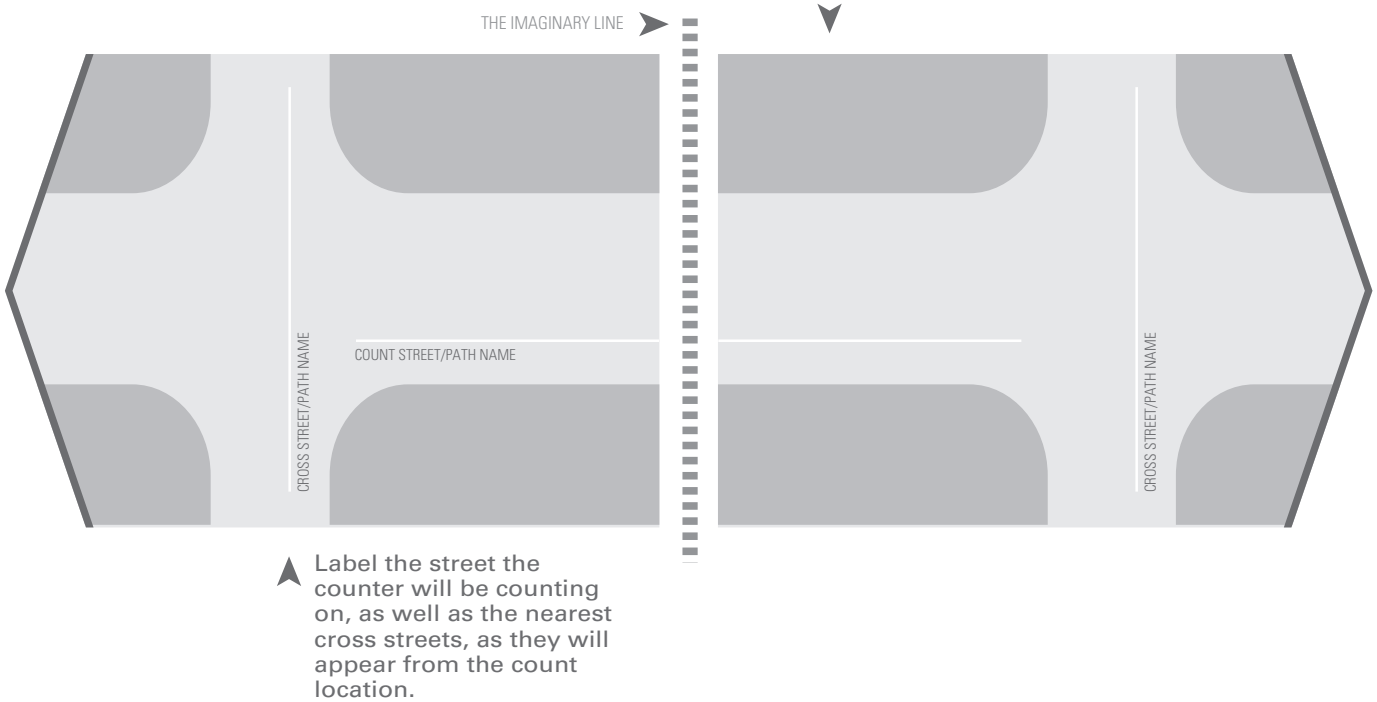
_____ AND _____ BETWEEN

RAIN ☐ YES ☐ NO

UNUSUAL CIRCUMSTANCES ☐ YES ☐ NO

NOTE

Mark which side of the street the counter should be located on with an **X** on the Count Location Schematic below.



Label the street the counter will be counting on, as well as the nearest cross streets, as they will appear from the count location.

SCAG

ACTIVE TRANSPORTATION INTERVAL COUNT FORM

PAGES _____ PAGE OF _____ TOTAL

INTERVAL STRT/END : AM PM FROM : AM PM TO

LOCATION _____ STREET PATH

COUNT WHEN THEY CROSS THIS IMAGINARY LINE

TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY		
TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY	HELMET	NO HELMET
TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY		
TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY	HELMET	NO HELMET

	FEMALE	MALE	CHILD	ADULT	ELDERLY	TOTAL	
	FEMALE	MALE	CHILD	ADULT	ELDERLY	NO HELMET	HELMET	TOTAL
	FEMALE	MALE	CHILD	ADULT	ELDERLY	TOTAL	
	FEMALE	MALE	CHILD	ADULT	ELDERLY	NO HELMET	HELMET	TOTAL

SCAG

ACTIVE TRANSPORTATION INTERVAL COUNT FORM

PAGES _____ PAGE OF _____ TOTAL

INTERVAL STRT/END _____ : _____ AM PM FROM _____ : _____ AM PM TO

LOCATION _____ STREET PATH

TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY

TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY	HELMET	NO HELMET

TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY

TOTAL	MALE	FEMALE	ADULT	CHILD	ELDERLY	HELMET	NO HELMET

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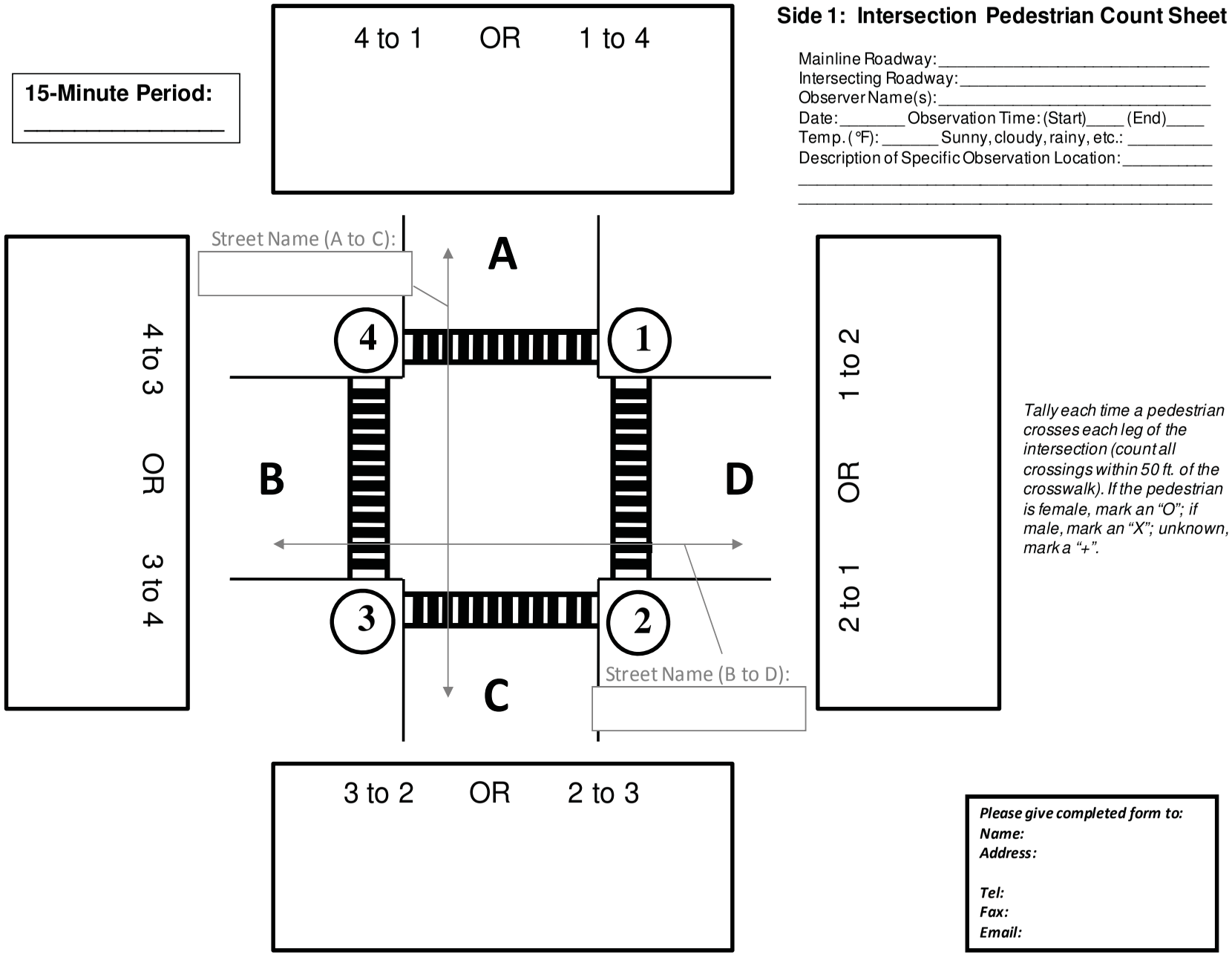
1-F

UC Berkeley SafeTREC Count Forms

Side 1: Intersection Pedestrian Count Sheet

Mainline Roadway: _____
Intersecting Roadway: _____
Observer Name(s): _____
Date: _____ Observation Time: (Start)____ (End)____
Temp. (°F): _____ Sunny, cloudy, rainy, etc.: _____
Description of Specific Observation Location: _____
_____
_____

15-Minute Period:
_____



Tally each time a pedestrian crosses each leg of the intersection (count all crossings within 50 ft. of the crosswalk). If the pedestrian is female, mark an "O"; if male, mark an "X"; unknown, mark a "+".

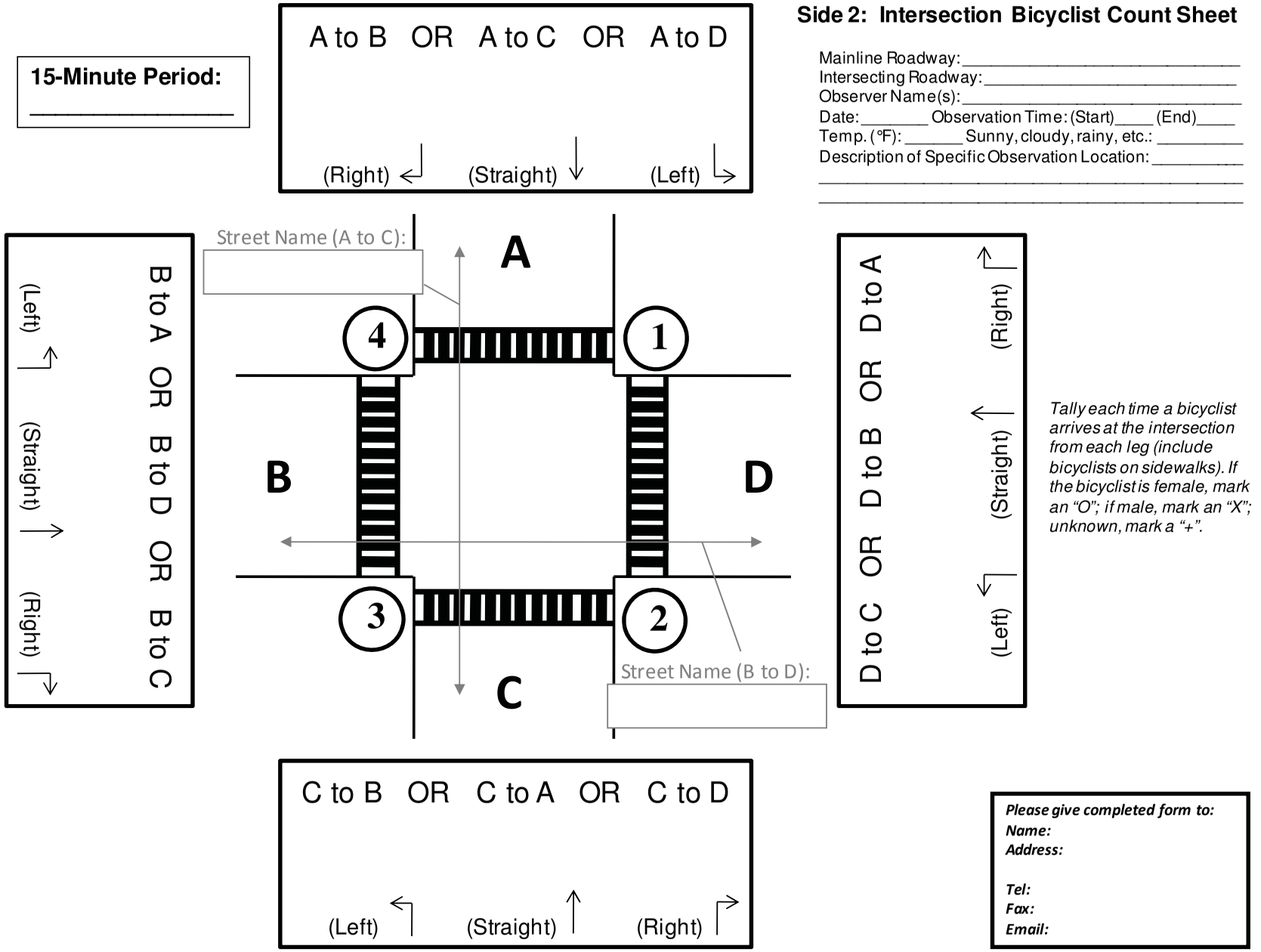
Please give completed form to:
Name:
Address:

Tel:
Fax:
Email:

Side 2: Intersection Bicyclist Count Sheet

Mainline Roadway: _____
Intersecting Roadway: _____
Observer Name(s): _____
Date: _____ Observation Time: (Start) ____ (End) ____
Temp. (°F): _____ Sunny, cloudy, rainy, etc.: _____
Description of Specific Observation Location: _____
_____
_____

15-Minute Period:
_____



Tally each time a bicyclist arrives at the intersection from each leg (include bicyclists on sidewalks). If the bicyclist is female, mark an "O"; if male, mark an "X"; unknown, mark a "+".

Please give completed form to:
Name:
Address:

Tel:
Fax:
Email:

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2-A

Count Survey Questions

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Thank you for participating in the Bay Area Pedestrian and Bicycle Count Guidelines survey!

MTC is seeking input from local and regional agencies, community organizations, and count collection companies to develop pedestrian/bicycle count guidelines for the Bay Area region.

This survey is designed for all relevant entities even if they do not currently conduct pedestrian/bicycle counts. The survey will take approximately 10 to 15 minutes to complete.

Your input will help set priorities for the regional guidelines. Key goals for this effort are to:

- **Establish a methodology for collecting counts, providing consistent and highly useful data regionwide**
- **Set standards for incorporating data into a regional database**

Once methodologies are established, MTC will engage stakeholders through interactive workshops and distribute draft count guidelines.

What agency, company or community organization do you represent?

Your Name	
Title	
Agency/Organization/ Company	
City/Town	
Email Address	

How would regional pedestrian and bicycle count guidelines be useful to you? Please rate each item's usefulness.

	Very Useful	Somewhat Useful	Not Useful
Increasing competitiveness in obtaining grant funding	○	○	○
Providing regional consistency in collecting count data	○	○	○
Storing count data through a regional database	○	○	○

Other/Comments

Has your organization collected bicycle and/or pedestrian counts?

- ○ Yes - Both Pedestrian and Bicycle
- ○ Yes - Bicycle Only
- ○ Yes - Pedestrian Only
- ○ No

What type of ped/bike counts do you collect? Check all that apply.

- ☐ Manual counts (in-field)
- ☐ Manual counts (in-person review from camera footage)
- ☐ Automated counts (pneumatic tubes)
- ☐ Automated counts (infrared sensor)
- ☐ Automated counts (video imaging)
- ☐ Automated counts (seismic sensor)
- ☐ Automated counts (radar sensor)
- ☐ Automated counts (pressure sensor)
- ☐ Automated counts (magnetometer)
- ☐ Automated counts (inductive loops)
- ☐ Other (please specify)

In general, how often do you collect ped/bike counts? Check all that apply.

- [ ] Continuously
- [ ] Daily
- [ ] Weekly
- [ ] Monthly
- [ ] Yearly
- [ ] Every other year
- [ ] When required
- [ ] Other (please specify)

What format do you currently use to store ped/bike count data? Check all that apply.

- [ ] Spreadsheets (e.g., Excel)
- [ ] GIS Database
- [ ] Other Database
- [ ] Other (please specify)
- [ ] Scans of handwritten count forms
- [ ] Unknown
- [ ] None

Do you map your ped/bike count data?

- ( ) Yes
- ( ) No

Comments

Does your ped/bike count data include geocoding to a GIS shapefile?

- ◯ Yes
- ◯ No
- ◯ Unknown

Comments

How is mapping ped/bike count data useful to you?

For ped/bike count efforts, do you use standardized methods, training information, and/or forms from “best practice” resources such as the National Bicycle and Pedestrian Documentation Project (NBPD), National Cooperative Highway Research Program (NCHRP), Federal Highway Administration (FHWA) Traffic Monitoring Guide, or Southern California Association of Governments (SCAG)?

- ◯ Yes
- ◯ No

Which best practice methods do you currently follow? Check all that apply.

- [ ] National Bicycle and Pedestrian Document Project (NBPD)
- [ ] National Cooperative Highway Research Program (NCHRP) Guidebook on Pedestrian and Bicycle Volume Data Collection
- [ ] Federal Highway Administration (FHWA) Traffic Monitoring Guide
- [ ] Southern California Association of Governments (SCAG) Active Transportation Database
- [ ] Other (please specify)

Please describe how you use existing best practice methods and/or existing resources, and what are some advantages/disadvantages.

If you would like to be conducting ped/bike counts more frequently, what factors restrict you from conducting more? Check one option that best applies.

- ○ Lack of staff resources
- ○ Lack of budget
- ○ Lack of clear guidance on how to collect counts
- ○ N/A
- ○ Comments/Other

What factors restrict your agency/community organization/company from conducting ped/bike counts? Check one option that best applies.

- ◯ Lack of staff resources
- ◯ Lack of budget
- ◯ Lack of clear guidance on how to collect counts
- ◯ Comments/Other

For manual ped/bike counts (in-field or video review), what **demographic** information about people walking and bicycling do/would you find useful? Please rate each item's usefulness.

	Very Useful	Somewhat Useful	Not Useful
Children (e.g., Under 12 years old)	◯	◯	◯
Senior Citizens (e.g., Over 65 years old)	◯	◯	◯
Gender (e.g., female bicyclists)	◯	◯	◯

Other (please specify)

For manual ped/bike counts (in-field or video review), what **behavioral** information about people walking and bicycling do/would you find useful? Please rate each item's usefulness.

	Very Useful	Somewhat Useful	Not Useful
Pedestrian Crossing Behavior (e.g., crossing without a "walk" signal)	○	○	○
Helmet use (bicycling)	○	○	○
Sidewalk riding (bicycling)	○	○	○
Stopping behavior at intersections (bicycling)	○	○	○
Bicyclists riding in the wrong direction	○	○	○
Bikeshare users	○	○	○
E-Scooters and other electric personal mobility devices	○	○	○
Skateboards/rollerblades	○	○	○
Wheelchair or other mobility assistive device	○	○	○

Other (please specify)

Do you utilize big data such as Strava, Ride Report, or StreetLight to evaluate walking and/or bicycling?

- ○ Yes
- ○ No

Which services do you use?

- [ ] Strava
- [ ] Ride Report
- [ ] StreetLight
- [ ] Other (please specify)

Please describe how you use existing big data services/resources to evaluate walking and/or bicycling.

If made available at no or little cost, would you be interested in using big data resources such as Strava, Ride Report, or StreetLight to assist you in evaluating pedestrian and/or bicycling levels?

- ( ) Yes
- ( ) No

How might you use big data to assist you in evaluating pedestrian and/or bicycling levels?

Why would you NOT be interested in using big data to evaluate walking and/or bicycling?

If a regional database of ped/bike count data was developed, what type of information would be most useful for you? Please rate each item's usefulness.

	Very useful	Somewhat useful	Not useful
Behavioral characteristics	○	○	○
Demographic characteristics	○	○	○
Geocoded data for counts	○	○	○

Other (please specify)

If MTC provided ped/bike count training manuals, forms, and/or workshops, how useful would they be to your agency in conducting counts?

Very useful	Somewhat useful	Not useful
○	○	○

What materials (e.g., count training manuals, forms, and workshops) would be most helpful and why?

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3-A

Draft Guidelines Comments Matrix

MTC Pedestrian and Bicycle Count Program
Comment-Response Log for *Draft Pedestrian and Bicycle Count Guidelines*

Action Key
A – Accepted for consideration in Ped/Bike Count Guidelines
A-F – Accepted for consideration for future tasks
NA – No action needed
S – Support for Guidelines

Note: Additional comments/suggestions regarding phrasing or grammar are not included in this matrix, but they are incorporated in the revised Guidelines.

REF #	PAGE # (DRAFT)	REVIEWER	COMMENT	RESPONSE	ACTION
1	NA	Sylvia Star-Lack, City of Palo Alto	Looks good. Thanks for this!	--	S-NA
2		Marty Martinez, Safe Routes Partnership	We support the creation of these guidelines, and thank MTC for taking this project on, as unified standards that ensure an accurate bike/ped count throughout the region is important for meeting the region's climate, health, and activity goals related to Plan Bay Area, as well as gauging the region's achievement of other policy performance landmarks.	--	S-NA
3		Marty Martinez, Safe Routes Partnership	We also strongly support MTC's identification of a goal to support data collection for local jurisdictions to show before and after effects from new infrastructure and new grants such as state Active Transportation Program grants. Overall, the guidelines are strong and detailed and we support them.	--	S-NA
4		Marty Martinez, Safe Routes Partnership	On community engagement, the guidelines should add more detail about what is being referred to here. Are the guidelines suggesting using data collection methods as a way of increasing community engagement in transportation planning, or getting community members engaged in the establishment of count processes, or both? More information on best practices and uses of engagement should be provided in the guidelines.	The fourth count purpose has been retitled "Baseline Counts for Planning or Community-Based Efforts" rather than "Community Engagement", as it is about how pedestrian and bicycle counts support transportation and community planning efforts. Additional clarification provided in the memo text.	A
5		Marty Martinez, Safe Routes Partnership	In addition, the guidelines discuss collecting demographic data, but additional information should be provided on best practices on collection of this data, categorization, and use of the data. Appropriate collection of demographic data can help address income or cultural inequalities and access to infrastructure, but if done inappropriately, data collection could inspire fears of profiling, or generate concern/fear among community members. In addition, guidelines should ensure demographic data is protected from corporate use.	Discussion added to "Behavioral and Demographic Considerations for Manual Counts" (p. 16)	A
6		Ben Kaufman, Rails to Trails	1. Address demographic data collection in detail – from an equity perspective, it is vital to collect information on not just how many people are using the infrastructure, but the types of users as well ○ *It would be helpful to include a paragraph or two about how manual counts that record specific behavioral and demographic characteristics can help build a narrative about equity as it relates to bicycle/pedestrian mode split and facilities. While you discuss manual counts and how to record this info in the document, answering the question of "why" manual counts are important seems to be missing from the document, with the exception of section 3-1, which talks about it in the context of community engagement efforts. It may be helpful to talk about it as it relates specifically to equity, a word that is missing from the document entirely.*	Discussion added to "Behavioral and Demographic Considerations for Manual Counts" (p. 16)	A
7		Ben Kaufman, Rails to Trails	2. Address what constitutes a "trip" so as to avoid double-counting (i.e. how to distinguish between once person riding past the counter 200 times versus 200 people riding past the counter once, or whether such a differentiating matters or not) ○ *I know we had a brief discussion about this question at one of our subcommittee meetings, but I think it would be helpful to at least address the issue of double-counting somewhere in the document, if only to say that double-counting is not a major issue, and that people conducting counts don't have to worry about it. It might also help to define what constitutes a "trip" in the context of the double-counting question.*	Added clarification in "How to Conduct Manual Counts" (p. 15)	A
8		Ben Kaufman, Rails to Trails	3. SCAG's guidelines put a lot of emphasis on bicycle-to–transit access – put a similar focus in MTC's guidelines as well (i.e. how to determine whether a bicyclist is going to or coming from a transit stop/station) ○ *There is almost no mention of how to best conduct on-off counts to/from transit vehicles, or how to coordinate bike/ped counts with transit agencies in the document. This is important because it is transit agencies that are often conducting or at least helping to coordinate these counts, and it is also helpful to engage these agencies to determine placement of bike/ped counters, and to corroborate bike/ped count data with transit vehicle boarding and alighting data.*	The use of pedestrian and bicycle count data for transit planning purposes has been expanded and integrated into the purposes section of this memo ("Common Count Purposes" [p. 6]). A discussion about coordination between jurisdictions and transit agencies has also been added. The addition of guidance for conducting on-off counts will be considered based on feedback received from the MTC Internal Working Group and the Active Transportation Working Group (ATWG) Data Subcommittee.	A
9		Triana Crighton, Solano Transportation Authority	After circulating the draft guidelines internally, the general consensus is that we see no major issues with the technical guidance offered. We would like to voice concern on potential implications of the guidelines. Although these are merely recommendations at the moment, if they are mandated in the future as a precursor to regional funding, some jurisdictions may struggle due to the expensive cost of doing counts manually and purchasing quality equipment. We hope that the labor and cost of equipment is considered by MTC moving forward, especially if there is consideration to require specific counts for regional funds such as ATP (continuing to do counts every other year for a project following completion would be incredibly costly). Other than the above consideration, we found the recommendations to be reasonable.	The Pedestrian and Bicycle Count Guidelines are intended to provide an educational resource to provide recommendations and guidance, not requirements. As part of the Pedestrian and Bicycle Count Program, MTC is investigating ways to provide resources for jurisdictions to conduct counts.	S-NA

MTC Pedestrian and Bicycle Count Program
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REF #	PAGE # (DRAFT)	REVIEWER	COMMENT	RESPONSE	ACTION
10	10/11 and 20	Tori Winters, SFMTA	Please see below for feedback from SFMTA and the SF Planning Department. 1. How to count: the guidelines recommended that development related traffic studies conduct short duration automated count with minimum 7-day period (recommended counts over a 2-week period). a. Typically, SF Planning conducts counts over the course of 1-3 days, with a focus on our PM peak period (4-6pm) or our extended PM peak period (3-7pm), and for some larger area plans we may conduct counts for AM as well (i.e. The Hub Plan). **We would recommend that the guidelines should consider how resource intensive it may be for local jurisdictions to purchase and/or process 2 weeks' worth of automated count data.**	Text has been modified to clarify that two weeks is desired while 7 days remains a recommended period if resources are limited. (p. 20)	A
11	20	Tori Winters, SFMTA	2. When to count: the guidelines suggest Tuesday through Thursday from 6-9am and 4-7pm, and Saturday from 10am-1pm. a. This is somewhat consistent with SF Planning's PM peak hour for traffic studies as commented above. b. **We would recommend that the guidelines should also discuss seasonality in conducting bike/pedestrian counts. Typically, spring and fall months are less subject to peak and drops in pedestrian/bike travel during the summer and winter.**	A subsection entitled *Seasonal Effect on Count*s has been added to section entitled "When to Conduct Counts" (pp. 19-20)	A
12		Tori Winters, SFMTA	3. **Use of prior counts: it would be nice for the guidelines to provide some guidance on the appropriateness of using counts collected from other studies or sources.** For instance, the use of prior counts may occur if counts have not changed substantially under existing conditions (e.g. due to lack of new development, circulation changes, or travel patterns).	We will review this with MTC staff and the ATWG, and research precedents.	A
13		Tori Winters, SFMTA	4. The proposed guidelines seem to be light/vague on guidelines for capturing data on pedestrians that use wheelchairs, mobility scooters, canes, support canes, or other visible mobility devices. **As a regional agency we would recommend that MTC set the gold standard for this. When collecting data for pedestrians this information is important for understanding the needs of pedestrians, not just their volumes**.	Additional text has been added to subsection entitled *Pedestrian-Related Behavioral and Demographic Characteristics* in the section "Behavioral and Demographic Considerations for Manual Counts" (pp. 16-17)	A
14		Tori Winters, SFMTA	5. **Due to the vital nature of this pedestrian information, we would recommend that pedestrian counts only be collected through manual counts as this level of granularity cannot currently be captured by automated counts**. We realize that as technology continues to improve, more granular data about pedestrians might be able to be captured by automated counter technology. When this is a reality we would endorse pedestrian count data collected through automated or manual methods.	We have emphasized counting pedestrians manually but have also provided guidance on using automated methods (e.g., video capture) for this purpose.	A
15		Jennifer Stanley, City of Oakland	Based on the information provided so far and at the meetings, the City of Oakland has no comments. Thanks, and let me know if you have any questions.	--	S-NA
16		Nancy Humphrey, City of Emeryville	We in Emeryville are in support of these protocols.	--	S-NA
17		Laura Timothy, BART	Primarily I would like to have counts for wheelchairs included. Wheelchair users are often lumped in with pedestrians but have different needs regarding the street scape environment. I would also like to see a count of scooters is this is possible.	Guidelines for counting electric and non-electric scooters has been added to guidelines for manual counts (including video review).	S
18	17	Drennen Shelton, MTC	I would really recommend you add a **short** paragraph at the end of the guidelines, or, probably better yet, in the manual counting section (behavioral and demographics paragraph), and use the heading of accessibility or equity considerations. The very short paragraph (few sentences) could discuss that there is a lack of meaningful data that can be used for analyzing travel behavior and/or understanding barriers to mobility for people with disabilities. Much of the data that ***IS*** collected is for project-level ADA compliance, or to inform project enhancement or service improvements. And where possible, it is important to include data collection about people with disabilities.	Discussion has been added to the subsection entitled *Pedestrian-Related Behavioral and Demographic Characteristics* in the section "Behavioral and Demographic Considerations for Manual Counts" (pp. 16-17) This discussion may expand based on additional feedback received from MTC staff and the Active Transportation Working Group Subcommittee.	A

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19	14	Drennen Shelton, MTC	The other aspect that could be included in this section: - *Seniors/Older adults (since you have included children)* - *Adaptive bikes (older adults and PWD are using these more and more!)*	These items have been added to the subsection entitled *Pedestrian-Related Behavioral and Demographic Characteristics* in the section "Behavioral and Demographic Considerations for Manual Counts" (pp. 16-17)	A
20		Drennen Shelton, MTC	Also, I'm curious as to why you didn't include mention of scooters. But, don't feel like you have to get back to me on this. It just seems odd that it's not at least footnoted.	Guidelines for counting electric and non-electric scooters has been added to guidelines for manual counts (including video review).	A
21	6	James Hinkamp, CCTA	Consider adding a fifth count purpose for year-over-year (or other temporal period) monitoring, to track growth trends at a given location so that "hot spots" can be determined and also serve to prioritize investments in local and regional bike-ped systems.	We will consider for incorporation into the final guidelines (to be approved by the ATWG in late 2019/early 2020) and will follow up with MTC staff to determine feasibility.	A-F
22	6	James Hinkamp, CCTA	Several modifications are suggested to "Figure 1", including: • Consider re-labeling as "Table 1", since the data is presented in tabular form. • Request greater explanation/definition of "Preferred" vs. "Optional" vs. "Required". For example, under what authority are certain count types "required"? • The count purpose categories are bulleted in the Figure whereas they are numbered in the body text. It may be helpful to readers to use numbers for easier cross-referencing between table and text.	Figure 1 has been relabeled and revised accordingly, including count methods referenced as either "preferred" or "optional", removing references to "required" methods.	A
23	12	James Hinkamp, CCTA	The last listed category at the bottom of this page states "The following times should be avoided…". We suggest modifying this phrase to "Caution is recommended when considering manual counts for the following:". In certain cases, it may be reasonable to seek all-weather biking and walking data such as to/from sporting event, concert/music festival, industry conventions, etc. for context-specific study, and to determine the impact of rain/cold on usership, therefore we encourage MTC to reconsider precluding these altogether.	Additional clarifications have been added to the "When to Conduct" [Manual] Counts section (p. 14).	A
24	13	James Hinkamp, CCTA	We support future consideration by MTC of standardized paper count forms and developing a mobile app.	--	S-NA
25	15	James Hinkamp, CCTA	We respectfully request MTC reconsider the assertion that "There are currently no permanent technologies available for collecting pedestrian and bicycle counts at intersections…". To our knowledge, several vendors have successfully deployed products capable of multimodal counts, using algorithms to differentiate active transportation modes and vehicles.	Some additional text has been added to "4B. Short Duration and Permanent Automated Counts" (p. 18). This topic may be investigated further based on feedback received from the ATWG Data Subcommittee and MTC staff as we finalize the guidelines.	A
26	16	James Hinkamp, CCTA	Suggest adding two factors for choosing the right type of automated count equipment: • Site susceptibility to varying weather (hot/cold, dry/hot), and • Site and equipment security We believe these considerations have merit in order to broadly ensure there is minimal risk of damage to valuable count equipment and resources.	These factors to consider when siting automated count equipment have been added to the "Choosing the Right Type of Automated Count Equipment" section (p. 20).	A
27	19	James Hinkamp, CCTA	Two modifications are suggested to "Figure 9", including: • Similar to Figure 1, consider relabeling as "Table 9", since the data is presented in tabular form • We also suggest reformatting the tabulated information with larger font size, for better legibility, and use higher resolution visual imagery	Figure 9 has been relabeled and revised accordingly.	A
28	21	James Hinkamp, CCTA	We would support future funding by MTC for a pilot count equipment exchange program among participating jurisdictions.	This is addressed in the Factor Groups memorandum to be circulated to members of the ATWG Data Subcommittee and MTC staff.	A-F
29	7,15,16, 17	James Hinkamp, CCTA	I also have some minor edits and corrections that will be sent by email.	These were sent as an email attachment. Revisions completed.	
30	3	Lauren Ledbetter, VTA	To further support efforts to get a regional count program funded, suggest working in the benefits of such a program.	Additional text about program benefits has been added to the memo introduction to provide some further background.	A
31	3	Lauren Ledbetter, VTA	These goals suggest the document should ONLY focus on recommendations that support the goal of regional count program for modeling purposes. I think there is value in including the other count purposes. However, I think the guidelines omit some useful guidance for other types of counts (before-after, traffic counts, community engagement) It seems like the guidance is most applicable to a regional count program for modeling purposes. (e.g. screen line only recommendation) Suggest either narrowing the guideline focus to just the regional count program or expanding the recommendations on the other types of counts.	Additional clarifying text about program benefits has been added to the memo introduction and purposes sections to provide some further background.	A
32	6	Lauren Ledbetter, VTA	Is there a reason for every other year? For how long? (Comment is regarding follow up counts in Before and After count efforts)	Guidance has been revised to recommend two follow-up counts within a 2-4 year period. (p. 6)	A

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33	6	Lauren Ledbetter, VTA	Some additional purposes that may or may not fit into these four purposes: Establish exposure in order to compare crash risk across a geographic area. Understand mode split along a corridor.	Discussion has been added to "Comment Count Purposes" in the paragraph discussing the count purpose of "Modeling Travel Modes for Forecasting Future Travel Demand" (p. 7).	A
34	6	Lauren Ledbetter, VTA	are intended to measure any change in bicycle or pedestrian activity associated with an infrastructure project.	Revised text as suggested (p. 6)	A
35	10	Lauren Ledbetter, VTA	Add: Tracking change in volume over time.	Discussion has been added to "Comment Count Purposes" in the paragraph discussing the count purpose of "Modeling Travel Modes for Forecasting Future Travel Demand" (p. 7).	A
36	10	Lauren Ledbetter, VTA	Text revision – see PDF	Revised text as suggested (p. 10)	A
37	11	Lauren Ledbetter, VTA	[This comment is regarding this text in the guidelines: *We do not recommend capturing turning movements of pedestrians and bicyclists as part of intersection counts…*] I suggest reconsidering this recommendation. Count firms that I have worked with typically collect turning movements for bicyclists and crosswalk counts for pedestrians. I find this data is easy to understand and use. This would be a ready source of data you could mine for a regional count database. It may also be difficult to get the count firms to count any differently (crosswalk counts are used, I believe, in traffic simulations). Crosswalk counts permit one to estimate exposure. However, crosswalk counts may not provide accurate volume counts. They undercount pedestrians that turn a corner and overcount pedestrians that cross multiple legs of the intersection. Guidance on when to collect crosswalk counts vs. other types of counts would be useful.	Best practices are trending away from intersection counts. This consideration will be addressed by the ATWG Data Subcommittee and MTC staff. Text has been added to recommend that – when intersection counts are desired – a count collection firm with experienced staff is recommended to conduct intersection counts rather than volunteers. (p. 10)	A
38	11	Lauren Ledbetter, VTA	[Regarding "Count Locations"] how many count locations?	We have added NBPD methodology to determine related guidance (p. 12)	A
39	11	Lauren Ledbetter, VTA	[This comment is regarding this text listing recommended locations for conducting counts. • *Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.)* • *Key corridors that can be used to gauge the impacts of future improvements* • *Locations where counts have been conducted historically* • *Locations where there are ongoing counts being conducted by other agencies through a variety of means, including videotaping* • *Gaps and pinch points for bicyclists and pedestrians (potential improvement areas)* • *Locations where bicycle and pedestrian collision numbers are high* • *Transit stops/stations to gauge pedestrian and bicycle access to transit*] I find this too general to be useful. Count locations depend on the purpose of the count. Some examples, based on my experiences: Before-After Counts - Existing Facility * Collect before counts on the road/sidewalk that is being improved and at parallel routes * Collect after counts at same locations * parallel routes are there as a control Before-After Counts - To-Be-Constructed Facility (e.g. bike path) * Collect counts on parallel facilities and/or on sections of path "downstream" and "upstream" of the new segment * Collect after counts at same locations and on new facility. Traffic Studies *Locations to be determined by CMP network/intersections, requirements of development/city Modeling * Identify locations based on factor groups Exposure * Locations that meet a certain threshold for number of bike/ped crashes Tracking Change over Time * locations that represent different factor groups * Any place where placement will answer a question you want answered factor to abandon the locations and use new ones)	Text has been added as suggested (p. 11)	A

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REF #	PAGE # (DRAFT)	REVIEWER	COMMENT	RESPONSE	ACTION
40	12	Lauren Ledbetter, VTA	[This comment is about the following text: *Ideally, three count periods should be conducted at a count location over a one week period, with three weekday morning counts, three weekday afternoon counts and one midday Saturday count.*] This is seven total count times. Phrasing seems like it is just three.	Text has been clarified (p. 14)	A
41	12	Lauren Ledbetter, VTA	[About "Dates/Times to Avoid" subsection] Add hazardous air qualilty events (from my observations, Fall 2018 air quality hazard from Camp fire seemed to reduce biking and walking)	Additional bullet has been added to this subsection.	A
42	13	Lauren Ledbetter, VTA	[About "Dates/Times to Avoid" subsection] Add note: Be cautious about scheduling counts after Daylight Saving time (November to March). Darker commute hours reduce the number of people walking or biking.	Additional discussion has been added to this subsection.	A
43	15	Lauren Ledbetter, VTA	[About this text: *Number of Characteristics to Evaluate: The number of characteristics evaluated by a single person at a count location should be no more than 3.]* This also depends on the volume at the count location. Option: have two people at the same location, one collecting counts, one collecting demographic/behavioral characteristics.	Guidance has been revised to recommend a maximum of 3 characteristics if a single person is counting numbers of pedestrians/bicycles as well as behavioral/demographic characteristics, and a maximum of 6 characteristics for someone counting behavioral/demographic characteristics only. (p. 16)	A
44	15	Lauren Ledbetter, VTA	See item # 39 above. Same thing here for count locations for automated counts	Text has been added as suggested (p. 16)	A
45	16	Lauren Ledbetter, VTA	Consider the following when establishing factor groups: * Land Use Characteristics (density, diversity) * Socio-Economic Characteristics (income, age, perhaps also family status such as children/no children) * Transportation Characteristics (availability of bike facilities, ped facilities, high-frequency transit stops) Will the factor groups consider recreational bike riding in the hills? Use NHTS or BATS or other surveys and research associated with those surveys to see if there are statistically significant correlations between sociodemographic and proclivity to walk or bike. Transit is a major pedestrian generator and should be included in any factor group analysis.	These comments may inform the development of factor groups as part of this effort, to be first presented in a memorandum submitted to the ATWG Data Subcommittee and mtc staff in September 2019.	A-F
46	16	Lauren Ledbetter, VTA	Suggest working with Regional Model Working Group when developing factor groups.	We are coordinating with the Regional Model Working Group in developing factor groups.	A-F
47	20	Lauren Ledbetter, VTA	[regarding Big Data Considerations] AS FYI: San Jose is beginning validation of Streetlight Data. VTA is in conversation with Streetlight to test limited data in the county to see if there is desire to purchase such data. We may be evaluating bike/ped count capabilities as part of this. I have been told it is significantly more expensive to include bike/ped count data.	Comment has been logged – we will follow-up with VTA to see if purchasing Streetlight data is a cost-efficient and reliable method to obtain pedestrian and bicycle data, so that big data may be considered for inclusion in future editions of the MTC Regional Pedestrian and Bicycle Count Guidelines.	A-F
48		Lauren Ledbetter, VTA	Missing from document: guidance on how to count special instances: Bicyclist walking bike through crosswalk Bicyclist riding bike through crosswalk Multiple people on a bike (count as one person or one "vehicle")	These items have been added to the subsection entitled *Pedestrian-Related Behavioral and Demographic Characteristics* and/or the subsection entitled *Bicycle-Related Behavioral and Demographic Characteristics* in	A
			People on scooters, skateboards, skates Person pushing stroller or carrying baby (one or two people?) For screenline counts - what if someone crosses screenline repeatedly (e.g pacing smoker) or just sits there?	the section "Behavioral and Demographic Considerations for Manual Counts" (pp. 13-16).	
49		Lauren Ledbetter, VTA	Missing from document: More detailed guidance on how to count pedestrians, and challenges of counting turning movements at intersections vs. crossings at crosswalks. See my earlier comment about the recommendation to just do screenline counts.	See comment 37 response above. The guidelines are intended to provide general guidance, so additional recommendations for counting pedestrians may be considered, and/or outside resources will be referenced. In addition, count forms and manuals developed as part of MTC's Pedestrian and Bicycle Count Program can provide detailed guidance for counting pedestrians.	A

6-A

Count Equipment Cost Considerations

Image: SF Bike Coalition

Cost Summary

PlaceWorks conducted analyses to estimate costs for MTC to either start a counter purchase or a counter loan program. The costs prepared below assume an all-in total cost for 150 units plus MTC staff time that will allow for enough distribution of count equipment regionwide. First-year costs include the capital purchase of the unit. Per discussions with count manufacturers and research of best practice manuals on pedestrian and bicycle counts, maintenance of equipment, battery replacement, software updates, etc. are assumed to be 24% of the first-year costs and will occur on an annual basis. Note that while the purchase of a large number of units may lead to a reduction in per unit price, although confirmation of a bulk discount was not information received from the count companies that we contacted and thus did not factor that information into the analysis.

Staff hours are assumed to be 20 hours per month for the purchase program, and 40 hours per month for the loaner program through the life of the program. The counter purchase allows for the purchase of some more-expensive (but accurate) permanent counters, while the counter loan program only assumes the purchase or less-expensive (but mobile) counters.

Counter Purchase Program Cost = $610,000 for the 1st year, $155,000 for subsequent years.

Counter Loaner Program Cost = $250,000 for the 1st year, $80,000 for subsequent years.

Methodology and Assumptions Used for Counter Purchase Program Cost Estimates

Below is the detailed methodology and assumptions developed for the cost estimates on the counter purchase program, based on "Information Received from Count Manufacturers" section of this memorandum:

» **Counter Purchase Program Cost (Portable and Permanent Counters assessed)**

- 1st Year = $3,940 (average per unit), $591,000 (average per 150 units). 1st Year Cost Range $1,000 - $15,495 (per unit cost range), $150,000 - $2,324,250 (per unit cost range per 150 units).
- Service costs for Year 2 or after are approximately 24% of the 1st year cost, averaging $946 per unit, or a range of $240 - $3,719 per unit, for a total average cost of $141,900 for 150 units.
- Should also assume about 20 hours per month (240 hours yearly) of MTC staff time, billed at $50/per hour, totaling $12,000 per year.
- **Therefore, first-year costs for 150 units equals $591,000 (equipment) + $12,000 (staff time) = $603,000 (total costs) – round up to $610,000.**
- **Second-year costs (and costs in years thereafter) for 150 units is $141,900 (equipment) + $12,000 (staff time) = $153,900 (total costs) – round up to $155,000.**

For a counter purchase program, the following assumptions were considered:

» The appropriate technology/equipment is dependent on the location, installation and objective

» Enables MTC to obtain count equipment that is either permanent or portable

» Prices vary depending on the installation location, device type, site limitations and or length of road/path

» Consider there are costs for hardware and software

» Software application is often a separate cost and can be user/password based

» Data storage and data sharing are additional costs that need to be factored in

» Majority of the equipment manufacturers have installation costs that vary by the device/equipment (some have separate subcontractors for installation, e.g. Roadsys LLC)

» The agency may opt to install the devices themselves or hire contractors to install – should the agency opt to install the hardware, there are tools that need to be purchased in order to install

» Majority of the devices have a limited year warranty – maintenance costs may require battery changes or replacement of damaged parts

Methodology and Assumptions Used for Counter Loan Program Cost Estimates

Below is the detailed methodology and assumptions developed for the cost estimates on the counter loan program, based on "Information Received from Count Manufacturers" section of this memorandum:

» **Counter Loan Program Cost (Portable Counters assessed only)**

- 1st Year = $2,923 (average per unit), $438,450 (average per 150 units). 1st Year Cost Range $1,000 - $6,097 (per unit cost range), $150,000 - $914,550 (per unit cost range per 150 units).
- Service costs for Year 2 or after (based on the limited information received) are approximately 24% of the 1st year cost, averaging $702 per unit, or a range of $240 - $1,463 per unit, for a total average cost of $105,300 for 150 units.
- However, MTC staff time would likely be double the amount of just purchasing equipment, since executing loaner agreements with local agencies would likely demand more time. It is assumed 40 hours per month of MTC staff time (480 hours yearly), billed at $50/per hour, totaling $24,000 per year.
- Generally, it is assumed that MTC could get up to ½ of their investment back from agencies paying for a portion of the equipment through loaner agreements.
    - This means that the 1st year costs would actually be $1,462 per unit or $219,225 for 150 units the 1st year, with costs in Year 2 and thereafter running at an average of $351 per unit and $52,650 for 150 units.
- **Therefore, first year costs for 150 units equals $219,225 (equipment) + $24,000 (staff time) = $243,225 (total costs) – round up to $250,000.**

- **Second year costs (and costs in years thereafter) for 150 units is $52,650 (equipment) + $24,000 (staff time) = $76,650 (total costs) – round up to $80,000.**

For a counter loan program, the following additional assumptions will need to be considered:

» With a loaner program, MTC may be able to loan their equipment out to cities at a portion of the equipment cost as a way to recuperate the investment made into buying the automated count equipment
  - In the budget we prepared, we made a broad-based assumption that cities would pay 50% of the cost of the count equipment, so MTC would get 50% of capital and ongoing maintenance investment back

» A loaner program would limit MTC to only purchasing equipment that is portable – no permanently installed count equipment can be considered as part of the cost estimate

» A loaner program will require additional MTC staff time to execute loaner agreements on count equipment with local agencies throughout the San Francisco Bay Area

» Installation costs (depending on the count equipment) would be higher in the loaner program than the purchase program, since count equipment will likely be moved around more frequently than in the purchase program

Contracting out support to install/operate the counters

If MTC contracted out the required support/training to install and operate the counters, it would cost approximately $35,000 per year under the "purchase option" and approximately $70,000 per year under the "loaner option". However, this would likely relieve the bulk of staff time required for MTC staff, which should be helpful especially if staff resources are limited. However, it is assumed that a nominal amount of hours from MTC staff (perhaps 5 hours per month under both scenarios) will be needed to administer the program.

Counter Purchase Program w/Consultant Management Costs

» **First Year = $630,000**

» **Year 2 and years thereafter = $180,000 per year**

Counter Loaner Program w/Consultant Management Costs

» **First Year = $300,000**

» **Year 2 and years thereafter = $130,000 per year**

Information Received from Count/Equipment Manufacturers

VIMOC

Vimoc predominantly specializes in software/application development. The company works with numerous camera manufacturers; thus the hardware technology is not proprietary. The camera feed is run through their application/algorithms, and the software pulls the data (the software application is proprietary). The data is dependent on video footage, not sensor based data.

The fee per camera is approximately $3,000. The software application is linked to the device inside the traffic controller—as ped/bikes come in and out, their camera is capturing count data.

They confirmed that though the software/camera is portable, it would take a traffic engineer/trained specialist to install at any given intersection.

Roadsys, LLC

Roadsys develops both hardware and software for count analysis. Per discussions with Roadsys representatives, they recommend their Cycle Monitoring Unit (permanent) and SDR Radar Recorder (portable) devices. Roadsys, LLC can provide complete Turn-Key Services should MTC desire. The contract will install all of the equipment, take care of all of the maintenance, download and process the data and deliver it to the agency.

DEVICE	COST	SOURCE
CMU (Cycle Monitoring Unit) - Permanent	• $8,995 - $11,995 (hardware) • $3,500 (Software)	Roadsys LLC (Email Quote)
SDR Radar Recorder - Portable	• $3,499 SDR (hardware) • $499 anti-theft bracket, battery, charger, & locks • $2,099 (software)	Roadsys LLC (Email Quote)

Eco-Counter

Eco-Counter develops both hardware and software products for count analysis. Per discussions with Eco-Counter, the company recommends their MULTI counters, which are able to differentiate pedestrians from bicyclists.

Eco-Counter also sells the following products:

» Pneumatic tubes
» Inductive loop detectors
» Passive infrared sensors
» Pressure pads

DEVICE	COST	SOURCE
Multi-Use Counter in a Natural Post	•$4,205 - $6,255	Eco-Counter (Email Quote)
Multi-Use Counter in an Urban Post	•$4,750 - $6,880	Eco-Counter (Email Quote)
MULTI Multi-Use Counter (Mobile/Portable)	•$4,650 (hardware) •$50-$180 (for bands & tubes)	Eco-Counter (Email Quote)
Additional costs (on top of hardware):		
Installation Assistance	•$1,000 per day	Eco-Counter (Email Quote)
Replacement Part - Battery	•$35 - $45	Eco-Counter (Email Quote)
15-minute interval data collection (optional)	•$200	Eco-Counter (Email Quote)
Automatic Data Transmission (optional)	•$420	Eco-Counter (Email Quote)
Eco Vision Platform (Pro)	•$740 p/year	Eco-Counter (Email Quote)

In terms of recurring fees, the MULTI counters require replacement of batteries that power the bicycle sensor and the automatic data transmission every 2 years. If MTC opts for the automatic data transmission, there is an annual fee of $420/counter.

Count Equipment Rental Opportunities

PlaceWorks contacted three data collection firms (NDS, Jamar Tech, and Counts Unlimited) and neither company loans out their equipment, or has established a "device rental" program for existing clients. In addition, Eco Counter, Roadsys, and VIMOC did not mention opportunities to rent out their count equipment.

8-A

Goals Satisfied and Benefits Realized through Implementation of Count Program

Image: Jeremy Brooks/Flilckr

Short-Term Recommendations

- **Goals satisfied and advanced.** At the ATWG meeting in Spring 2017 to discuss advancement of the Regional Pedestrian and Bicycle Count Program, the group determined a number of infrastructure and program recommendations that should be prioritized by MTC for implementation. As part of advancing near-term items in this Detailed Implementation Strategy, the prioritized recommendations will complete the implementation of the following goals:
    - Support consistency across the region regarding when, where and how pedestrian and bicycle counts are conducted. (Recommendation 5)
    - Finalize the development of factor groups for count locations, so that a network of count locations can be developed to accurately reflect the number of people walking or biking regionwide. (Recommendation 8)
    - Serve as a regional resource for count collection best practices. (Recommendations 1-4, 9-11)

    Implementation of short-term recommendations will also be in the process of advancing goals supported by the ATWG below, with the goals fully satisfied within the medium-term timeframe:
    - Create recommendations for strategies that expedite increasing pedestrian and bicycle count locations regionwide, such as an automated counter loan or purchase program. (Recommendation 3)
    - Provide options to host count data through a web-based portal or database. (Recommendations 5-8)

- **Benefits realized.**
    - **Setting the groundwork to improve equity regionwide.** Developing criteria for pilot programs in Recommendations 2 and 3 can be developed to advance equity regionwide. Ideally, the intent is to direct programs to smaller cities and disadvantaged communities in the Bay Area that do not have the resources to manage the collection, analysis and storage of pedestrian and bicycle count data.
    - **Improving quality of transportation data.** As part of advancing Recommendations 5-8, developing infrastructure to improve the accuracy of pedestrian and bicycle count data can better determine where transportation investments are needed regionwide and those investments will better serve constituents.
    - **Increasing the number of jurisdictions participating in the collection of pedestrian and bicycle counts.** The development of count forms, instructional videos, count guidelines workshops and a dedicated webpage will make the collection, storage and analysis of pedestrian and bicycle counts easier to understand. (Recommendations 5 and 9-11) Agencies across the region in effect will be more likely to collect count data on pedestrians and bicyclists.

Medium-Term Recommendations

- **Goals satisfied and advanced.** Advancing medium-term recommendations will result in the fulfillment of two key core goals of the program as supported by members of the Active Transportation Working Group in 2017:
    - Provide options to host count data through a web-based portal or database. (Recommendation 13)
    - Create recommendations for strategies that expedite increasing pedestrian and bicycle count locations regionwide, such as an automated counter loan or purchase program. (Recommendation 14)

  These recommendations also continue to advance the implementation of goals satisfied through the previous implementation phase through additional evaluation of programs.
    - Support consistency across the region regarding when, where and how pedestrian and bicycle counts are conducted. (Recommendation 12)
    - Serve as a regional resource for count collection best practices. (Recommendation 12)

- **Benefits realized.**
    - **Increased funding through submittal and receipt of statewide funding for pedestrian and bicycle infrastructure and programs.** Medium-Term recommendations continue to improve and enhance all the benefits received as part of implementing Short-Term recommendations, through instituting the full roll out of the Regional Pedestrian and Bicycle Count Database (Recommendation 13) and the automated counter installation program (Recommendation 14). The roll out of these items will likely result in the Bay Area being more competitive in receiving statewide funds for pedestrian and bicycle infrastructure, resulting in improved multi-modal mobility. An analysis of the Bay Area's performance in obtaining infrastructure funding will likely be measured as part of criteria developed to measure the effectiveness of the Regional Pedestrian and Bicycle Count Program (Recommendation 12).

Long-Term Recommendations

- **Goals satisfied and advanced.** The integration of pedestrian and bicycle count data with other data sources clearly advances statewide and regional goals, including those directly supported by the members of the ATWG as part of advancing the Regional Pedestrian and Bicycle Count Program in 2017:
    - Advance local and regional goals in count collection, including:
        - Linking this effort to regional and statewide transportation policies/programs (e.g., Plan Bay Area and the Caltrans Active Transportation Program) and other database efforts. (Recommendation 15)
        - Integrating with other data sources, including bike share data, crash data, and travel data. (Recommendation 15)
        - Obtaining data that will help identify popular routes bicyclists and pedestrians utilize regionally. (Recommendation 15)

- Benefits realized.
    - **Advancing statewide and regional goals.** The construction of additional pedestrian and bicycle infrastructure resulting from the linkage of data sources (Recommendation 15) and increasing the amount of supportive programs (Recommendation 16) will result in the reduction of collisions, greenhouse gases and vehicle miles traveled, implementing statewide goals as described in AB 32 and SB 375 as well as those in Plan Bay Area and MTC's Vision Zero program.
    - **Financial benefits to linking data sources.** Linkage of pedestrian and bicycle data to other transportation and land use sources would likely translate into more opportunities to fund pedestrian and bicycle projects at a statewide and federal level. A comprehensive program dedicated to the funding of pedestrian and bicycle counts will likely improve opportunities for securing statewide and federal funds for items in the Regional Pedestrian and Bicycle Count Program (Recommendation 16).

8-B

Methodology for Organization of the Implementation Strategy

Recommendations in the implementation strategy are first grouped into timeframes to implement the Regional Pedestrian and Bicycle Count Program in defined project phases. Each timeframe (or project phase) is intended to build upon one another, so that the number of funding opportunities available, goals accomplished and benefits realized from the implementation of the Regional Pedestrian and Bicycle Count Program will expand over time.

- **Short-Term Recommendations** – to be **complete within a year** after receiving notice to proceed by MTC decision makers, with implementation items focused on the development of a Regional Pedestrian and Bicycle Count Database and its supportive programs.
- **Medium-Term Recommendations** – to be **complete within 2 ½ years** after receiving notice to proceed by MTC decision makers, with implementation items focused on the completion and launch of the Regional Pedestrian and Bicycle Count Database and its supportive programs.
- **Long-Term Recommendations** – to be **complete within 5 years** after receiving notice to proceed by MTC decision makers, with implementation items focused on refinements to the Regional Pedestrian and Bicycle Count Database and its supportive programs, as well as linking count data from the database to other data sources.

Recommendations in the implementation strategy are then grouped into recommendation types, as many components are required to ensure the database is effective in advancing the collection, storage and analysis of pedestrian and bicycle count data. In response, the implementation strategy has organized recommendations within each timeframe into the following key components.

- **Development of internal organizational resources** required for MTC to execute infrastructure and programs for the pedestrian and bicycle count program. These resources may take on the following forms:
    - **Development of working groups** composed of internal MTC Staff, outside organizations and public agencies dedicated to the advancement of the regional pedestrian and bicycle count database.
    - **Creation of partnerships with local agencies** to enhance the development of required infrastructure for the collection, storage and analysis of pedestrian and bicycle count data.
    - **Internal MTC Staff opportunities** to support implementation, including reallocation of resources to pursue grant applications, adjusting criteria in existing internal programs, or creating new grant programs to benefit the development of the Regional Pedestrian and Bicycle Count Program.
    - **Evaluation tools** to ensure that the Regional Pedestrian and Bicycle Count Program meets objectives and improves over time.
- **Infrastructure investments** needed to advance the collection, storage and analysis of pedestrian and bicycle count data. In addition to staff costs, significant costs will be incurred through capital investment

including all infrastructure investments required for the creation of the Regional Pedestrian and Bicycle Count Database and the installation, monitoring and maintenance of automated count equipment.

- **Creation of supportive programs** that will enhance the participation and understanding of collecting, storing and analyzing pedestrian and bicycle count data.

The most critical piece of the implementation strategy are the descriptions of individual recommendations. Each recommendation has a distinct purpose in advancing the Regional Pedestrian and Bicycle Count Program, with the following information provided for each recommendation in the implementation strategy described below.

- **A range of options are described for each individual recommendation** so that MTC may have flexibility in implementing the recommendation based on available funding, resources and support. Recommendations are segmented into three options based on the extent of scope and responsibilities assigned to consultants and to MTC Staff:
    - **Option "A"** accomplishes the full range of items requested by stakeholders involved in the development of the Regional Pedestrian and Bicycle Count Program. Recommendations are implemented primarily through consultant assistance, with MTC Staff limited to a management and review role.
    - **Option "B"** accomplishes a smaller magnitude of items originally requested by stakeholder groups involved in development of the Regional Pedestrian and Bicycle Count Program. While most recommendations will be implemented primarily through consultant assistance, with MTC Staff in a management and review role, development of some items may be directly accomplished by MTC Staff.
    - **Option "C"** satisfies the minimum requirements in order to advance programs and infrastructure for the Regional Pedestrian and Bicycle Count Database, with minimal consultant assistance.
- **Constituent support** to advance the recommendation, with stakeholder groups identified.
- **Responsible parties** that will lead the implementation of each recommendation organized by recommendation option, including whether key constituents involved include internal MTC Staff, consultants, outside public agencies, or community organizations.
- **Approximate costs and staff time** required to implement each recommendation option, with capital costs for infrastructure and any ongoing maintenance costs identified.

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8-C

Opportunities to Fund Count Program Recommendations

Short-Term Recommendations

There are a number of funding opportunities MTC Staff may elect to pursue in the short-term to implement recommendations in the Regional Pedestrian and Bicycle Count Program.

Pursue competitive grant applications. There are number of grant opportunities that are being released in 2020 that are tailored to funding recommendations in the Regional Pedestrian and Bicycle Count Program. MTC Staff may elect to develop grant applications directly or hire a consultant to prepare applications.

- The **Caltrans Active Transportation Program** is releasing their Call for Projects in Spring 2020, with applications due in Summer 2020. If MTC pursued funds for the Regional Pedestrian and Bicycle Count Program, it would be best positioned to pursue funds in the Non-Infrastructure category. Funds are highly competitive, although MTC may benefit through an allocation of ATP funding directed directly to MPOs.
- The **Caltrans Sustainable Transportation Planning Grant Program** is releasing their next Call for Projects in Fall 2020. Previous rounds of studies for the Regional Pedestrian and Bicycle Count Program have been funded by securing formula grants in the Sustainable Transportation Planning Grant Program.
- MTC Staff may also investigate future grant cycles offered through the **Bay Area Air Quality Management District,** especially those relating to the **Vehicle Trip Reduction Grant Program** through the Pilot Services project category.

Dedicate funds in MTC's annual budget. As MTC prepares their next annual budget for fiscal year 2020-2021, it is advised that a portion of funds can be dedicated to advance initiatives in the Pedestrian and Bicycle Count Program.

Investigate if there are funds in existing MTC programs that can be reprogrammed. As fiscal year 2019-2020 comes to a close, MTC Staff may see if there are discretionary planning funds available in existing programs that are unlikely to be spent by the end of the existing fiscal year. If this is the case, there may be an opportunity to quickly advance recommendations in the Regional Pedestrian and Bicycle Count Program.

Medium-Term Recommendations

Partnerships to leverage funds with other public agencies and community organizations may be considered when advancing medium-term recommendations. These partnerships may be developed as an action item in evaluating the effectiveness of the Regional Pedestrian and Bicycle Count Program in Recommendation 12 and augmenting funds for the automated counter installation program in Recommendation 14.

Develop partnerships with CMAs and transit operators to leverage funding sources. This includes potentially "swapping" federal funds with local/regional agencies in exchange for MTC receiving discretionary local funds to manage pedestrian and bicycle count programs.

Restructure utilization of OBAG funds. While this funding opportunity is contingent on MTC developing a regional policy direction to prioritize the collection, analysis and storage of pedestrian and bicycle counts, MTC

may have leverage to work with local jurisdictions on dedicating a portion of OBAG funds to supportive count programs.

Develop partnerships with community and research organizations (e.g., Transform, SafeTREC) to leverage planning funds and/or grants that support pedestrian and bicycle count programs.

Long-Term Recommendations

MTC Staff may elect to pursue the following funding opportunities in order to implement long-term recommendations in the Regional Pedestrian and Bicycle Count Program.

Awareness of upcoming voter initiatives. This includes coordinating with MTC executives and other key decision makers in the organization to ensure that any upcoming voter initiatives would include a provision for funding pedestrian and bicycle count infrastructure and programs, especially those where MTC has management of incoming funds.

Continuing to grow a regional grant program. As described further in Recommendation 16, expanding the automated counter installation program in Recommendation 14 to one that encompasses all aspects of collecting, storing and analyzing count data may be developed either directly by MTC or through formulating partnerships with other public agencies. This will create a dedicated source of funding for the collection, storage and analysis of pedestrian and bicycle count infrastructure and programs.