

Appendix II

Fresno Council of Governments

Bicycle and Pedestrian Count Technology
Deployment Pilot Project

Final Report

May, 2016



1. Introduction

Fresno Council of Governments (Fresno COG) embarked on the Bicycle and Pedestrian Count Technology Deployment Pilot Project in April 2015, when Fresno COG was selected by the Federal Highway Administration (FHWA) as one of the ten Metropolitan Planning Organizations (MPOs) nationwide to receive \$20,000 for the Bicycle and Pedestrian Count Technology Pilot Program. To strengthen the project funding, Fresno COG subsequently matched \$7,000 in cash for this project.

The Pilot Project kicked off in May 2015 and was effectively managed through Fresno COG's Congestion Management Process (CMP). The CMP Steering Committee has meetings regularly to discuss project-related planning and technical issues.

Over the past year, we received guidance and technical support from FHWA and the technical team FHWA assembled together for this pilot program. The pilot project was well-received by local agencies and higher education institutes. Five local agencies (cities and county) and Fresno State University participated in the program. In addition, the vendor, Eco-counters, provided excellent technical and customer support.

Collectively by May 2016, the agencies and university have collected four months' worth of bike and pedestrian data covering 23 locations ranging from suburban multi-use trails, and university campus to downtown pedestrian mall.

After the one-year pilot project phase, Fresno COG and local agencies will continue the count data collection utilizing the equipment acquired during the project. This document is to summarize the progress of pilot program up to May 2016, and give an overview of the data collected and report on lessons learned. The raw data is summarized in this report, and is available upon request.

2. Regional Settings

Fresno is the fifth largest city in California, and 34th in the nation, by population. Together with City of Clovis, the Fresno/Clovis Metropolitan Area forms the major urban core of the Fresno County. The population of the entire Fresno County has reached 1,000,000 according to the California Department of Finance (DOF) projection.

Located in the center of the California's San Joaquin Valley, Fresno has been challenged with a series of issues such as high poverty, air pollution and health related issues such as high asthma rate. A survey by the California Environmental Protection Agency (Cal-EPA) showed that several communities in Fresno are listed as the most disadvantaged communities in the State when measured against 19 environmental, economic and health factors. The region needs any help possible to promote alternative

transportation so that people will drive less, and walk and bike more, which can lead to better air quality and improved public health.

As MPO, Fresno COG is responsible for transportation planning for the Fresno region. Currently, through our Needs Assessment program, Fresno COG is conducting an inventory of existing and planned bike and pedestrian facilities in the region. Collection of bike/ped counts will complement the inventorying efforts and provide the communities with first-hand information about the usage of these facilities. Such bike/ped counts and infrastructure inventory will also be very usefully in developing bike/ped trip assignment for Fresno COG's regional travel demand model, which will be a huge step forward in quantifying the benefits of investment in bike/ped facilities.

Fresno COG's 2014 RTP/SCS proposed to invest \$112 million in bike and pedestrian facilities by 2040. Development of a non-motorized count program will help the region monitor the progress of such investment, and help evaluate the effectiveness of the investment. The bike/pedestrian count program will be a nice addition to Fresno COG's 2015 CMP update, which proposes to monitor traditional traffic counts, speed/hours of delay, and also safety, travel cost, transit ridership, vehicle miles traveled, etc. The combination of the CMP and other transportation monitoring efforts will serve as a report card to our communities on the effectiveness of transportation investment in Fresno region.

In addition, Fresno COG is in the process of developing an Alternative Transportation Plan (ATP), which will help the small cities and communities in Fresno County develop their bike and pedestrian plans. The bigger cities such as City of Fresno and Clovis, and the County of Fresno have had such bike/ped master plans in place and have been actively seeking funding to implement them. The bike and pedestrian count program will help communities implement the ATP and provide solid data support for bike/ped project funding applications. Furthermore, with the adoption of Complete Street Policy in more and more local general plans, the local governments are eager to gather bike/ped data and set up guidelines for such Complete Street Policies. Engineers and planners from many jurisdictions in Fresno region have expressed strong interest in such non-motorized counts to Fresno COG staff. It will be a very popular program if implemented in Fresno region.

3. Bike and Pedestrian Counting in Fresno Region

Conducting bike and pedestrian counts is new to this region. Before the pilot project, there is no historical bike and pedestrian data readily available. This pilot program provides a unique opportunity for local agencies and transportation planning community to get familiar with the state-of-the-art technologies and engage in the active transportation field with more accountable data.



The local agencies and university showed strong interest in the pilot program. Although the counter technologies are new to this region, the agencies are fortunate to have staff with ample experience of conducting vehicular counts, which is proven valuable. The following local agencies and university participated in the pilot project:

- City of Selma
- California State University, Fresno
- City of Clovis
- City of Fresno
- County of Fresno
- City of Reedley

4. Counter Technology Selection

As part of the pilot project, FHWA developed additional support and guidance for bicycle and pedestrian counting. Technical webinars sponsored by FHWA provided much information about best practices and state-of-art technologies in the fields of bike and pedestrian counting. The project steering committee used this information, with local conditions and project goals and objectives in mind, determined the selection criteria for appropriate technologies to adopt.

The criteria that were agreed upon require the counter technologies to be mobile, providing temporal coverage of continuous counting of at least two weeks, and capable of counting both bikes and pedestrians in a variety of environment including urban street, pedestrian malls, suburban trails, and rural/residential streets. Budget constrain is also a consideration as it affects the number of counters that can be deployed at the same time.

Based on the criteria, the steering committee looked into a host of vendors and their respective products. The counter technologies that were considered include:

- various People Counters from We Count People LLC, CountWise, to SenSource and Axper, and
- the following ruggedized traffic counters which were deemed more suitable for the intended outdoor environment:
 - MetroCount
 - Jamar
 - Iteris

- Eco-Counter
- Miovision
- Chambers Electronics

After extensive consultation with local agencies and counter manufacturers, Fresno COG decided on a combination of PYRO Box counters and pneumatic TUBES counters from Eco-Counter based on the following considerations:

1. These counters are widely used throughout North America, having clients in 42 States.
2. Working together, the two types of counters will meet the needs for counting bike and pedestrian at various locations.
3. The one-year complimentary automatic data transfer plan will save agencies data retrieving efforts (after the one-year free period, agencies still have the option to manually download the data).
4. Having two counter types from the same manufacturer will simplify data processing.

Given the limited budget for the pilot program, Fresno COG purchased four pairs of PYRO Box and TUBES counters from Eco-counter, one pair being capable of directional counts and the rest non-directional.



The vendor, Eco-counters, provided very good professional and technical support. In addition, the local agency staff has a lot of field experience. The installation process turned out to be very smooth. The local university originally wanted to use their students to install the counters, but eventually decided to use a traffic counting firm to do that.

Since all the counters are all equipped with cellular upload units, all count data is automatically uploaded to Eco-counter's server. We have set up data management accounts for the agencies to monitor and analyze the data. Automated data retrieval also facilitated the field operations where agency staff is in short supply. It is worth noting, that one of the PYRO Box counter was out-of-spec due to insufficient range. The manufacturer promptly diagnosed the issue and provided a loaner unit while the affected unit was repaired.

5. Count Location Selection and Scheduling

Five local agencies and one university eagerly participated in the pilot program. Each participating agency had multiple count locations proposed. The steering committee had to limit the location candidates to three per agency to balance the demand and the limited number of equipment available, while maintain good temporal coverage at each count locations.



Following the recommendation of the FHWA technical support team, the pilot program tried to allocate at least two weeks for each count location in order to capture enough temporal data to help determine the traffic pattern at a later time. COG staff tried their best to give each agency at least two-week of count time plus the transition period between agencies, while fitting the count schedule into the project's tight timeframe, which was further shortened by weather related factors, such as hot summer, wet winter, and holiday seasons. A copy of the scheduling spreadsheet can be found in Appendix A.

By May 2016, the program has gone through five agencies and one university. Each agency captured at least two-week's worth of data. In case of the university and City of Reedley, one month's of data were obtained by taking advantage of the holiday season and spring break.

6. Data Reporting

An added benefit for using Eco-Counter technology is the capability of managing all the count data from a single centralized database. The agencies can access their data through a web interface called Eco-Visio. Eco-Visio platform is the data portal provided by Eco-counters for users to handle the backend activities of the count program, such as keeping inventory, managing counter locations, processing count data, conducting analyses, and generating reports. With technical support from Eco-Counter, COG staff was able to set up individual sub users for each respective agency. Agencies have full control to their own count data, which they can view and modify. In the meantime, a group user with viewer-only rights gives them the capability of sharing data among the agencies under the umbrella of Fresno COG.

The screenshot shows the Eco-Counter web application interface. The header includes the logo and the text "Fresno Council of Governments". The main content area displays a list of counting sites, each with a summary of its performance and status.

Site Name	Average Daily Count	Last Data Date
PYRO-Box 1	415	05/25/2016
PYRO-Box 1 - Barstow & Fruit	163	>6 Months (10/02/2015)
PYRO-Box 1 - Barstow e/o Cedar-South Sidewalk	1,219	5 Months (11/30/2015)
PYRO-Box 1 - Enterprise Trail E/O Temperance	43	6 Months (10/22/2015)

Additional interface elements include a search bar, filters for User Type (Pedestrians, Cyclists), Type (Manual Data Retrieval, Automatic Transmission), and Tags (City of Fresno, City of Clovis, County of Fresno). The bottom of the page shows pagination controls and a footer with contact information and version details.



Count reports can be automatically generated within Eco-Visio, which greatly facilitates the data analyses and data processing. Count reports for all the counts collected up to May 2016 under the pilot program at 23 locations in five jurisdictions within Fresno County can be found in Appendix B.

7. Data Analyses

Students from California State University, Fresno, Department of Civil and Geomatics Engineering incorporated pedestrian and bike counts conducted by the University around its campus into their Transportation Planning and Design class project, and produced a report titled “Campus West Active Transportation Planning Pedestrian Survey and Non-Motorized Traffic Count”. The report presented their analyses of the count data in conjunction with survey information and manual counts. A copy of the report can be found in Appendix C.

During early February 2016, City of Clovis conducted an interesting comparison of the data collected by the counters with video footage recorded by camera. The counting and video recording were conducted simultaneously at two locations on the city’s Old Town Trail. They found the accuracies of the counts range from 16% under counting to 19% over counting. The factors affecting accuracy of bike/ped count include: trail users stopping in front of the PYRO counter, multiple trail users crossing the counters simultaneously, groups of trail users, strollers, and bike trailers. Detailed reports of the comparison can be found in Appendix D.

8. Final Thoughts

The overall experience of the pilot project was positive. It generated a lot of interest among the local agencies with regard to counting pedestrians and bicycles. A number of agencies already express interest in performing additional counts at more locations in the future, or conduct before and after analysis for the reopening of pedestrian mall to vehicular traffic.

No doubt the collection of bike/ped count data will enhance the multi modal aspect of Fresno COG’s and agencies’ transportation planning process. The pilot project also provided a rare opportunity for Fresno COG and local agencies to access the state-of-the-art technologies and acquire valuable experience in the field. Lessons learned from the pilot project will benefit Fresno COG and local agencies in the future deployment of the technologies. Some of these considerations include:

- Selecting the count site requires careful planning, as suitable poles are hard to come by in rural settings. And sometimes, trees within the sensor range can generate false counts when certain combination of temperature and movement of the tree from blowing wind.
- In a trail setting, the pole that counters attached to can be attractive for people using it for stretching exercise, hence generating disproportionately large counts in a short amount of time.
- Smaller gauge tubes (Greenway tubes) present less tripping hazards for pedestrians, which is especially beneficial to trail counting. Since there is a strong interest among the local agencies to count the trails, the count program can benefit from further investment in purchasing more Greenway tubes.

Appendices

Appendix A Scheduling Spreadsheet

Appendix B Count Reports

Appendix C Campus West ATP Report

Appendix D City of Clovis Video/Count Data Comparison

The Appendices and complete report can be found at <http://www.fresnocog.org/congestion-management>