2015

Estimating Total Number of Attendees to an Open Free Non-Gated Outdoor Cultural Event – A Case of Zora! Festival in Eatonville, Florida, USA

Tadayuki Hara
Rosen College of Hospitality Management, University of Central Florida, tadayuki.hara@ucf.edu

Kimberly S. Severt
University of Alabama, ksevert@ches.ua.edu

Valeriya Shapoval
University of Central Florida, valeriya.shapoval@ucf.edu

Follow this and additional works at: http://tourismresearch.econo.yamaguchi-u.ac.jp/jtephm

Part of the Hospitality Administration and Management Commons, Recreation Business Commons, and the Tourism and Travel Commons

Estimating Total Number of Attendees to an Open Free Non-Gated Outdoor Cultural Event – A Case of Zora! Festival in Eatonville, Florida, USA

Estimating Total Number of Attendees to an Open Free Non-Gated Outdoor Cultural Event – A Case of Zora! Festival in Eatonville, Florida, USA

1. Introduction

An organizer of a cultural festival receives various external funding and donations, including but not limited to, support from cultural or tourism-related groups, companies and local governments. Event organizers have to face an occasional allegation that they tend to inflate numbers of attendees because the success of events would often be evaluated by the simple benchmark, a number of total attendees. In the meantime, sponsors are interested in identifying a more accurate number to have better assessment of their return on investment.

There have been various attempts to measure numbers of attendees in open non-gated, non-ticketed events, such as festivals, concerts, political rallies and demonstrations. Thanks to advances in technologies, there are more options to estimate attendance in open events, but considerations for costs often prevent organizers from adopting such scientific counting measures. This study shows how a budget-constrained organization can secure its estimation accuracy by utilizing traditional non-electronic devices and manpower with pre-planning of major points of foot-traffic inflow.

2. Literature Review

2.1 Attendee Counts

There are literatures which refer to reasons for upward biases of counting attendees in an open festival. Raybould, Mules, Fredline, and Tomljenovic (2000) mention that "in the highly competitive special event industry, events and festivals are often forced to justify public investment in terms of their contribution to the local economy". Berlonghi (1995) lists various important factors to control the crowds in special events which listed size of the crowd at the top of his list while it provides summaries of several ways of distinguishing and assessing crowds within the context of special event planning.

Counting the size of a crowd has been an issue for at least 2000 years: "and those who ate were about five thousand men, beside women and children" says the Bible (Matthew 14:21), which was quoted by Watson and Yip (2011) who also said "estimating crowd size at public events has become much more about public relations and point-scoring than about a quest for the truth" (p. 105).

There are some literatures which attempted to forecast numbers of attendees using some predictor variables. One study examined factors influencing the sport attendance of a sample of "consumers of Color and Caucasian" who resided in a large urban area on the West Coast of the United States. Regarding sport attendance, significant differences were revealed in the importance of the event culture factors such that the event's family appeal, entertainment, and promotions were more important to the consumers of Color than they were to the Caucasian consumers (Armstrong, 2008). Researchers studied whether racial factors would affect attendance to basketball games. Empirical results offer strong

support of the hypothesis that, if fans prefer to see players of their own race, teams will be influenced in their selection of players by the racial composition of their market area. (Burdekin and Idson, 1991). Other researcher picked up the professional baseball game and concluded that the interactive effects of team identification, social influence, and perceived ticket value were found to influence spectators' intentions to attend future games (Wakefield, 1995).   Recent study examined whether park attendance was affected by red tide events. The analysis found that the presence of red tide did not affect park attendance. However, the appearance of the search phrase "red tide" in local newspapers revealed significant reductions in average daily park attendance of 398 (21 percent) visitors (Morgan *et al.,* 2011). Lacey, Sneath, Finney and Close (2011) looked into the impact of repeat attendees on an event sponsorship effect. Researchers found, that repeat attendees at sponsorship events have improved opinion about the sponsor's image. One research studied on an issue of international buyer behavior at trade shows and it would affect future attendance differently in Japan and in the U.S.A. (Smith, Hama, and Smith, 2003).

Various literatures explore ways to increase accuracy of counting attendees utilizing available technologies. Raybould et al. (2000) said that in open events where ticket counts or equivalent measures were not available, researchers were forced to find other ways of estimating attendance. Techniques used in other disciplines can be of value in these circumstances. They utilized a technique used by ecologists in population estimates and applied the method for a question of counting event attendance. Their use of aerial photography was illustrated using a study of an open event in Queensland. While it is relatively "cost-effective", a similar act would require about minimum of US$500 per shoot in Central Florida area, excluding a fee to hire an expert who can determine numbers of herd in our target area.   Yip, Watson, Chan, Lau, Chen, and Xu (2010) propose a practical method to obtain an estimate of the size of the crowd and its standard error. This method has been implemented in practice and, compared with other counting methods, is found to be more efficient; more advanced and have less scope for bias. An example of this method was used to estimate attendance at the 2006 demonstration in Hong Kong. Watson and Yip state the following. "150,000 people demonstrated in Hong Kong, (and) 10,000 students protested in London against tuition fees. A million people lined the streets for the Royal wedding. Or did they? Do not believe what you are told. Estimating the size of a crowd is a difficult business – even for those who actually want to get it right." (Watson and Yip, 2011).

There are scientific methods to count the number of people in terms of utilization of available technologies. Seidler, Meyer, and Gillivray (1976) proposed a field procedure for collecting data at stationary mass rallies. They used area sampling, dividing the crowd into zones and sectors, and collecting data during stationary phases of assemblages. Regazzoni, Tesei, and Murino(1993) studied crowd estimation based on the image-processing and inference phases applied to the acquired data. Images come from a set of visual cameras oriented towards a zone to be monitored. Some significant features extracted from each acquired image are related to the number of people present in the monitored scene using the nonlinear models obtained by means of dynamic programming in an off-line training phase. Regazzoni and Tesei (1996) applied the visual image technology at a metro station and had a "very promising results in terms of estimation accuracy and real-time response capability". The

current crowding estimate is derived from the application of the static correlation models to the extracted observations (evidence), combined with the prediction obtained from the temporally previous estimate (expectation). Their approach improved the estimation accuracy obtained by using only current available data (i.e., static knowledge), and can predict crowding values between two successive acquisitions. Griffith (2010) used geospatial information to make better estimate of attendances. The rapid expansion in recent years of US NCAA college football bowl games raises the practical research question of whether or not bowl game attendance (i.e., counts) can be predicted from readily available simple measures, which include: a team's win–loss record, distance separating a team's school from the city hosting its bowl game, and the payout of a bowl game. The study finds that bowl game attendance appears to be predictable with a contemporary spatial statistical model that is a special case of a Poisson probability model, whose mean is a linear combination of payoff levels and distance of the closer team to a stadium, two factors over which individual bowl organizing officials have some control. (Griffith, 2010).

Attendee count has been discussed in religious research area as well. Researchers in Religious studies concluded that the histories yield novel measures of commitment, testable implications of rational choice theory, and compelling evidence that attendance responds strongly to changes in the opportunity cost of time and that the time series of attendance counts showed much about the health of the church, the habits of its members, and the interplay of religious "supply" and "demand." By comparing the attendance series for congregations from different denominations, researchers saw aspects of denominational culture that surveys could not capture (Iannaccone and Everton, 2004).

Mules and Dwyer (2005) summarize that methods exist for 'counting the crowd', such as tag and recapture and aerial photography. They concluded that further research is needed to find cost-effective and practical methods of crowd estimation. Evans (1996) assessed visitor typologies and behavior and the impact of new and extended visitor attractions to establish a visitor baseline and initial forecast of demand for the year-long Millennium Festival. This study focused on the historical development and experience from international EXPOs and comparative city festivals, in addition to the problems of visitor measurement and forecasting inherent in an open urban tourism destination. While we are interested in measuring the actual number as accurate as possible, the idea of establishing certain baseline would be useful in designing our attempt. Kelly, Williams, Schieven, and Dunn (2006) state that the non-gated and multiple entry point character of many destinations make it difficult to accurately estimate visitor attendance, demonstrating the application of the approach in the mountain tourism destination of Whistler, British Columbia, Canada.

Tyrell and Ismail (2005) presented methods on how to generate reasonably accurate estimates at an open-gate festival. The festival used in their study had well-defined entrances and occurred over a 4 day period enabling them to use the gate counts and required tracking of differences in visitation patterns throughout the period of the festival. Researchers were staged at each of the seven gates where they counted individuals exiting the festival for exactly a 15-minute period each hour the festival was open and these counts were then recorded for each gate and hour. Fifteen-minute intervals were chosen as

this would account for 25% of the festival. These counts were then extrapolated to produce flow at each of the gates.

Techniques from engineering area are attractive and available as long as there is sufficient funding for actual implementation of the method. However, many regional events organized by non-profit organizations do not have sufficient budgets to be allocated for such research. The non-profit organization that hosts the cultural festival in this study shares the similar budgetary constraints as with many other non-profit organizations. Our study will follow a basic structure utilized in Tyrell and Ismail mainly due to budgetary constraints, while we intend to record all the procedures for the sake of others with similar constraints.

2.2   Background for the Research

Association to Preserve Eatonville Community (PEC), located at Kennedy Boulevard, Town of Eatonville, Orange County, Florida, USA, has been hosting an annual outdoor event under the name of "Zora! Festival" for over 20 years.   The Town of Eatonville claims that it is the first African-American incorporated municipality in 1887 in the history of the United States of America.
Zora! Festival is held during the last week of January each year for the duration of one week, and the festival culminates at the weekend outdoor festival held in an open field, mostly controlled by the Town of Eatonville. The areas marked for the festival, including the main street, Kennedy Boulevard, will be kept free from motor vehicles during the event. Town of Eatonville had a population of 2,159 in 2010 according to US Census.
The organizer of the Zora! Festival, PEC, has been receiving various funding support and donations, including but not limited to, Tourism Development Tax allocations from Orange County. While some funders have been in need of basic information such as number of attendees to assess economic and social impacts of the festival, PEC, however, has not conducted any formal counting of attendees due to several factors. The outdoor festival used to limit attendees' access by creating fence around the Center Stage area, where the musical performance occurs, but that set-up only counted the number of paid-attendees to a musical concert, resulting in underestimation of the total attendance. In the press release made on January 25, 2012, N.Y. Nathiri was quoted to have said, "Our annual event attracts an intergenerational audience from diverse backgrounds, cultures, and regions throughout the world. Since 1990, more than 750,000 attendees have enjoyed the 23rd Annual Zora Neale Hurston Festival of the Arts and Humanities." (Association to Preserve Eatonville Community, 2013) Simply divided, the annual average attendees in the last 22 Zora! Festivals would be 34,090.

Since 2009, PEC abolished the limited fencing set-up in response to popular criticism from local residents and businesses that the festival became a secluded event, detached from spirit of celebration by the local community. In response to feedback from the local community, abolishment of the fencing made the counting task more challenging, yet, a need for objective and scientific counting of attendees remained as an important task for PEC to provide more credible attendee counts to the funders, donors and other stakeholders. Based on our assessment of the challenges, we planned a scientific counting

method, requiring one dozen of hand-held tally counting machines. These are manual devices with which you can count numbers of certain events, such as numbers of people, vehicle, by pushing the mechanical button by your thumb, without any batteries or on-off switch. A mechanical window shows you total counted numbers in four digits, up to the maximum of 9,999 at a time. The cost for the device is US$6~9 per device, resulting in total material cost for approximately US$100.

Identification of Challenges

In summary, we have identified the challenges in counting the accurate number of attendees to this festival as follows:

- Neither researchers nor the organizer have enough ability to secure hundreds of investigators to count all the participants (population) for the full three day duration of the event.
- Since the festival is "open, non-gated, non-ticketed and free to anybody", there is no existing infrastructure to track the volume of attendees.
- There are multiple paths to come to the main area of the outdoor festival because of lack of fencing in the residential area, while major routes of out-of-town entrances can be identified.
- Due to limited amount of budget, researchers have to rely on the most cost-effective method to count the attendees with acceptable sampling methods.

3. Methods

Based on the above four challenges, we decided to conduct scientific methods of counting sample numbers at multiple locations that have been identified as main traffic passing points through interviews with multiple stakeholders, including but not limited to, the organizers' staff, executive director, senior local residents, town personnel, and local business owners. While our gate counting structure would be similar to what Tyrell and Ismail used in their 2005 study, the difference would be that we do not have controlled gates as they had. Based on the interviews, the organizer agreed to our assessment that counting the sample of the attendees at the three major points of traffic inflow should capture at least 80%, possibly 85 to 90% of the total number of attendees. While the choice of our method was based on the alleged versatility, this may also verify the validity of the traditional method to count attendees to large, open, and non-ticketed events at a time when more advanced yet costly technologies are available for researchers with larger budget at their disposal. Aerial photography with expertize of ecologists as used in Queensland, Australia (Raybound et al 2000) could have been considered in our analysis if we did not have constraints of (1) no budget for hiring aerial photographer (2) non-existence of ecologists in our team (3) existence of partial indoor events in the area, and (4) existence of large trees in central area of the festival.

3.1 Proposed Locations

Three major inflow points were identified and their sum had been estimated by multiple local stakeholders to constitute 80 to 95% of the total inflow of the same time slots.

1. Major points of pedestrian inflow at three locations
   - Entrance from parking spaces (by High School Gym: count inbound/eastbound only)
   - Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)
   - Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)

For verification purposes, we set up one central point in the festival where we set a virtual cordon line across the street and counted traffic for both directions.

2. One central point of all traffic at the festival
   - Kennedy Boulevard In front of the Museum (count traffic for both directions)

3.2   Justifications for the locations

In prior consultation with the organizer and residents, we proposed the three traffic check-points at the location of major traffic inflows to capture (1) all attendees who park in a large parking area, which is designated and marketed by the event organizer, PEC, as official parking lots (2) all attendees who came by public transportation (shuttle bus provided by local public bus company, LINKS), and (3) most, if not all, of attendees who walked into the Town of Eatonville from neighboring municipality of Maitland, and small number of those who parked their vehicles illegally on streets and yards of local residents in town.

First counting position: Entrance from Parking Lot
The first counting position was the entrance from the official parking lot where all those who parked their vehicles would have to pass through. This includes passengers who came on the chartered buses. The location of the parking lot is the athletic field of the former high school, which is completely fenced around permanently. At this location, we were confident that we could count all the foot-traffic with the highest accuracy, as there was only one gate to walk to the festival from the parking lot.

Second counting position: Corner of Kennedy Boulevard and Gabriel Avenue
The second counting position was at the corner of Kennedy Boulevard and Gabriel Avenue, which was the best location to capture most of the foot traffic from the public bus services providing free shuttles and drop passengers at the north of Gabriel Avenue. There can be leakages of attendees who decide to walk through narrower back streets, such as Clark Street, to bypass some sections of the festival, but we verified with the festival organizer that the overwhelming majority of attendees who use public shuttle buses would come through this route.

Third counting position: Corner of Kennedy Boulevard and Calhoun Avenue
The third counting position was at the corner of Kennedy Boulevard and Calhoun Avenue, which was the east side of the street portion of the festival. Because of the massive presence of Macedonia Church, one of the larger buildings in Eatonville, traditionally the attendees would not use the back roads, such as Lemon Street or Clark Street but would pass this junction through Calhoun Avenue. Because it is often

perceived as the eastern end of the street vendors, counting west-bound attendees at this point enabled us to capture attendees who came from the eastern part of the Eatonville into the outdoor festival area.

In order to put the total inbound traffic of attendees in pespective, we set up one spot in the area which is perceived to be the center of all street vendors, at the crossing of Kennedy Boulevard and College Avenue. The data on bilateral flow of pedestrians at this cordon line are only collected as a reference and thus count bi-directional movement of both east and west-bound traffic. The data were used to put the overall inflow of attendee count number in perspective with the traffic volume at the center of the outdoor event.

All those locations as well as the central points are shown in the Figure 1.
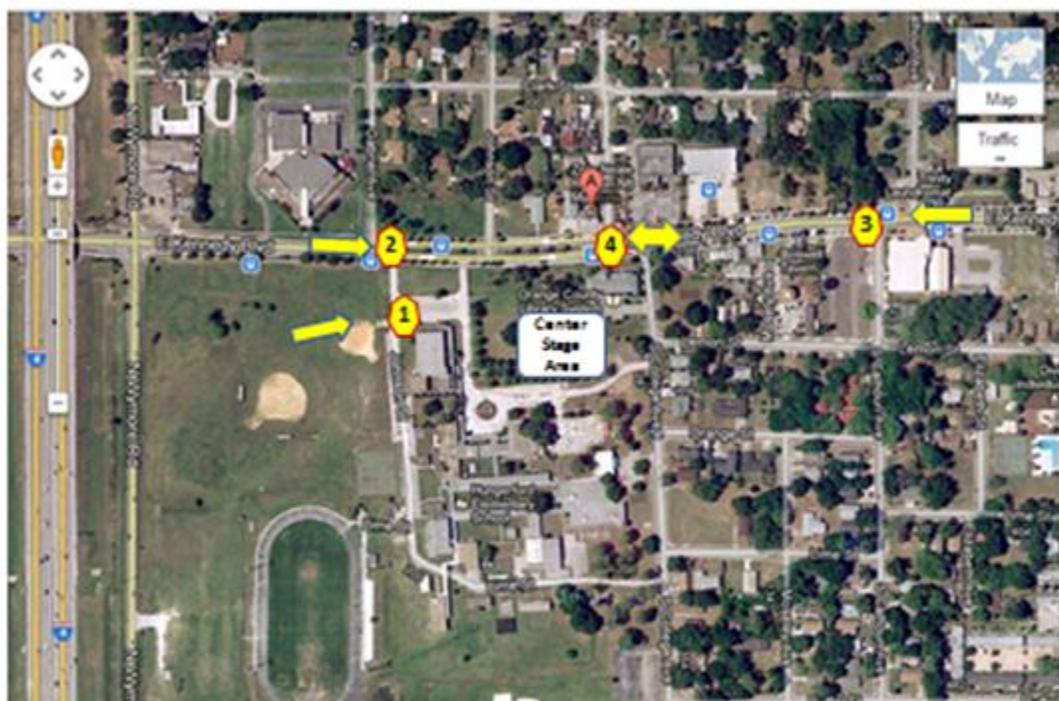
(1) Entrance from parking spaces (by High School Gym: count inbound/eastbound only)
(2) Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)
(3) Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)
(4) Kennedy Blvd In front of the Museum (count all traffic)

Figure 1: Map of Eatonville: Attendee Counts Location

Source: made by the authors based on Google Maps (2014)*

---

* While the authors claim they have complied with required quotation protocol accepted in the authors' nation (USA), we are not fully certain if that would be fine with rest of nations in the world. Therefore, editors may modify contents or advise the authors and readers any new protocols for quoting third party materials in non-commercial, academic publications, in case any issues arise.

3.3   List of Specific Assumptions on the event

Since we collected our data on sampling basis, we should specify those assumptions which became basis for our study as follows;

- **Our Observed Events – Friday Afternoon, Saturday and Sunday daytime in Eatonville**

As for the scientific sampling, traffic was counted for fifteen minutes in each hour, or one quarter of hourly volume at each location, following the method used by Tyrell and Ismail (2005). The assumption was that the number of traffic counted in fifteen minutes (sample) in the selected one hour represent one quarter of the actual traffic flow per hour.

Due to scheduling arrangement of students, the data collectors' team could only come to start the counting at 10:00 - 10:15 a.m. as the first time slots on Saturday and Sunday. Therefore, we assumed that all traffic before 10:00 a.m. of each day would be equal (=1.0) to the sum of one hour traffic between 10:00 a.m. and 11:00 a.m. As for the evening counts, we had to be more realistic about the detailed assumptions. We covered up to 18:00 p.m. each day, but the amounts of foot-traffic at early evenings substantially differ each day. While we expected the lightest traffic on Friday, we expected more traffic on Saturday when evening events were scheduled. We expected there would be more lingering traffic on Sunday, when attendees traditionally hunt for bargains from the vendors who have to pack up their unsold items. Therefore, we assumed that all traffic after 18:00 p.m. of Friday would be half (=0.5) to the sum of one hour traffic between 17:00 p.m. and 18:00 p.m., that all traffic after 18:00 of Saturday was assumed to be one and a half (=1.5) to the sum of one hour traffic between 17:00 p.m. and 18:00 p.m., and all traffic after 18:00 p.m. of Sunday would be assumed to be equal (=1.0) to the sum of one hour traffic between 17:00 p.m. and 18:00 p.m. The organizer of event agreed to the assumptions, which were necessary to assess both prior and post hours of our direct observations by our volunteer-based students.

- **Non-observed Events: Events held outside of Eatonville, Friday morning, Evenings**

Events that occurred outside of Eatonville or outside of Friday-Sunday duration were either ticketed events or events held inside of buildings in which precise attendee counts were much easier to capture. The only major component that we had to make assumptions to calculate attendees would be the morning portion of the "Educational Day" on Friday to which we could not dispatch our observers.

- **2012 Zora! Festival Attendee Counts in the Friday Morning of "Education Day"**

Due to scheduling, we could not observe the morning portion of the Friday outdoor festival, which is called an "Education Day." We have a record from parking guards that in total of thirty-one school buses ferried students in the morning of Friday, most from schools in the Orange County, Florida area. School buses used locally have capacity between 65 passengers and 78 passengers for students and chaperones who accompany those students. Since there were no detailed records of exactly which size buses were used, we take the median number of 71.5, rounded up to 72 passenger capacity as the typical full-load capacity of a school bus. Based on multiple interviews with school chaperones and

some members of organizers, we use the 80% as the best estimates of utilization of each bus to their full capacity. With those assumptions we calculate the total numbers of attendees to the Friday morning "Education Day" to be 72 x 31 x 0.80 = **1,786.**

As for non-students bused attendees to the "Educational Day" in the morning, it is reasonable for us to see smaller numbers of non-students bused attendees except school-age kids and their custodians who reside locally. Thus, we extrapolated the actual numbers of attendees based on our first direct observation, and used that number to be extrapolated back into the morning to estimate non-students bused attendees to be 62 x 4 hours = **248.**

Therefore, Friday morning attendee counts estimates were:

   (1) Students bused   = 1,786
   (2) Non bused students & non students   =   248

Total attendee counts on Friday will be displayed later in Table 2.

- ***2012 Zora Festival Attendee Counts outside of three-day Outdoor Festival***

Those events which happened outside of our direct observation besides "Education Day" in Friday morning were not anticipated to be that large due to the fact that no outdoor musical entertainers perform during educational events; therefore the numbers collected by the event organizer, PEC were adopted as shown in the Table 1.

Table 1: 2012 Zora Festival Attendee Counts Outside of 3 day Outdoor Festival

Date (& Time if tracking by each event performance)	Event/Performance Name (& Venue, if applicable)	Total Attendance
1/21/2012	Eatonville Story - St. Lawrence A.M.E. Church and Rollins College (Various locations in Eatonville and Winter Park)	200
1/23/2012	An Evening in Eatonville-With Zora - Macedonia Missionary Baptist Church	350
1/24/2012	In Conversation with Dr. Irina Morozova - Orange County Library - Eatonville Branch	25
1/25/2012	Engaging Audiences on the University Campus: An Exploration of the ZORA! Festival 2012 Theme - UCF Arboretum-1:00 - 3:00PM	10
1/25/2012	A Panel Discussion - "Landscapes & Places:" - Their Roles in Community, Locally and Globally - UCF Library - 7:30 - 9:00PM	25
1/26/2012	Yards & Gardens Mobile Tour in Historic Eatonville - 8:30AM - 4:30PM	7
1/26/2012	Opening Exhibition Reception & Gallery Talk-Zora Neale Hurston Museum & Eatonville Library - 5:00-9:00PM	100
1/27/2012	Continuation of Yards & Garden Mobile Tour - 8:30AM-4:30PM	6
1/27/2012	Outdoor Festival of the Arts and Humanities 9:00AM-5:00PM - "Education Day"	
1/27/2012	Hip Hop Evening Concert - Mario	42
1/28/2012	Conclusion of Yards & Garden Mobile Tour - 8:30AM-4:30PM	5
1/28/2012	HATitude Brunch - Crowne Plaza Orlando Downtown - 10:00AM - 1:00PM	100
1/28/2012	In Concert with Keith Sweat	1,500
1/29/2012	Ecumenical Worship Service - The Life Center Church	100
Total Count of Attendance/Surveys	**Total attendees outside of 3 day outdoor events**	**2,470**

Source: made by authors based on record submitted by the organizer, PEC

3.4 Actual Counting Methods

Considering both cost constraints and simplicity of the operation, we decided to use hand-held tally counting machines, which can be purchased from any major office-supply store. Retail price of the tally machine, which makes a clicking sound to move the mechanical display, is less than US$9 per machine. We trained the student team, with doctoral students taking leading roles, and trained them on the proper procedure.

- **Usage of the tally machine**

Even though it is simple enough to have only two control buttons (one to record the number of clicks, the other to reset the count back to zero), it was absolutely necessary to re-set the number back to zero after the researcher wrote down the counted number hourly on the designated form.

- **Identify objects which form a clear cordon line**

Faculty members visited all the observation spots to make sure that they had spotted two permanent fixtures between which an imaginary straight line can be easily drawn in our data collectors' head. The rule applied was that any human which passed this cordon line in the specified direction would be counted.

- **Immediate Reporting of the counted numbers**

To minimize risk of losing important data, faculty members enforced mandatory hourly meetings with each observers immediately after their task was completed each hour. This way, each observer's data remained in their log book, while the faculty kept complete duplicate data from all the observers for a running count.

4. Results

The results of the observations are shown in Table 2 and 3.

Table 2: Zora Festival Attendee Count Project Worksheet and Total

FRIDAY	1			13:00-13:15	14:00-14:15	15:00-15:15	16:00-16:15	17:00-17:15	0.5	Autual Sum	Multiplied by Four
1. Entrance from parking spaces (by High School Gym: count inbound/eastbound only)	32	32	32	32	32	16	16	9	7	3.5	211.5	2,632
2.Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)	4	4	4	4	4	17	43	10	3	1.5	94.5	378
3.Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)	26	26	26	26	26	26	44	41	27	13.5	281.5	1,126

Estimates from School Bus Count in the Morning (up to 13:00)					**1,786**	-- Entrance from Parking Spaces (***2,632*** = 211.5x4 + 1,786)					**4,136**

SATURDAY	1	10:00-10:15	11:00-11:15	12:00-12:15	13:00-13:15	14:00-14:15	15:00-15:15	16:00-16:15	17:00-17:15	1.5	Autual Sum	Multiplied by Four
1. Entrance from parking spaces (by High School Gym: count inbound/eastbound only)	34	34	277	212	198	229	291	204	147	221	1847	7,386
2.Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)	17	17	17	100	81	97	158	109	121	182	898.5	3,594
3.Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)	34	34	119	210	346	396	407	377	380	570	2873	11,492
												22,472

SUNDAY	1	10:00-10:15	11:00-11:15	12:00-12:15	13:00-13:15	14:00-14:15	15:00-15:15	16:00-16:15	17:00-17:15	1	Autual Sum	Multiplied by Four
1. Entrance from parking spaces (by High School Gym: count inbound/eastbound only)	7	7	26	66	74	97	42	55	40	40	454	1,816
2.Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)	8	8	18	18	69	85	73	72	14	14	379	1,516
3.Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)	32	32	30	68	134	202	232	203	152	152	1237	4,948
												8,280

Total sum of the Inflow at three observation spots										*2~4 sum*	**34,888**

Source: Made by the Authors Based on Data on Actual Counts during the Festival

Table 3: Zora Festival Attendee Count Project All Traffic at Center

	Before 10:00	10:00-10:15	11:00-11:15	12:00-12:15	13:00-13:15	14:00-14:15	15:00-15:15	16:00-16:15	17:00-17:15	After 18:00		
1. Entrance from parking spaces (by High School Gym: count inbound/eastbound only)	241	241	241	241	241	155	203	193	102	51	1909	7,636
2.Kennedy Blvd & Gabriel Ave (by Life Center Church: count inbound/eastbound only)	125	125	418	904	897	1,319	1,452	1,172	1,047	1,571	9030	36,118
3.Kennedy Blvd & Calhoun Ave (by Macedonia Church: count inbound/westbound only)	42	42	100	263	359	597	698	823	631	631	4186	16,744
Total sum of the traffic at the cental Spot of Street Festival										*1 sum*		**60,498**

Source: Made by the Authors Based on Data on Actual Counts during the Festival

5.   Conclusion

The three-day outdoor festival is estimated to have at least 34,888 attendees as shown in Table 2, we can add the numbers of attendees outside of the three day outdoor festival from Table 1.

The total numbers of attendees for 2012 Zora! Festival counted at the three observation points was 34,888 + 2,470 = **37,358.** Please note that the number is most likely underestimating the true numbers of total attendance to the festival because of the leakages of attendee inflows that did not pass through any of the three cordon lines. Since the capture ratio (= 1 – leakage ratio) has been assessed prior to the observation to be in the range of 80 to 95%, we created Table 4 to show the logical flows to estimate the total numbers of attendees to all the week-long events of the festival in 2012.

Table 4: Estimation of Total Number of Attendees in One-week long Zora! Festival 2012

Scenario #	Assumed % of counts that three cordon line observations captured to the total Number	Total Numbers of Attendees to 3-day Outdoor Festival based on our Observation and with our methods	Other Events in the One-week Festival	Estimated Total Numbers of Attendees in One-week Zora! Festival
1	**80%**	43,610	2,470	46,080
2	**85%**	41,045	2,470	43,515
3	**90%**	38,764	2,470	41,234
4	**95%**	36,724	2,470	39,194
5	**100%**	34,888	2,470	*37,358*

Source: made by the authors

While the minimum numbers of 37,358 can be supported with the established methodology, the most likely true numbers of total attendees to the festival would fall in between the range of 39,194 and 46,080.

5.1   Interpretations and Implications

We could not count the Friday mornings because of our students' scheduling. According to the organizer, PEC, Friday morning is the time predominantly for the school children who visit the festival for educational purposes. Thus, we have to make a series of assumptions based on actual numbers of buses.

Saturday was clearly the day with the highest traffic at all the observation spots. At 11:00 a.m. there were surges of incoming traffic from parking spaces and the inflow of traffic steadily continued into late afternoon and even evening. Unfortunately, we did not schedule our students to work after 18:00 p.m. but the volume of inflows did not die down into the evenings, due perhaps to scheduled musical events and vendors' willingness to operate into evening hours to cater to foot traffic. We witnessed a sustained high volume of inflow up to 20:00 p.m. a couple of hours after our students left the festival.

On Sunday, there was not a steady inflow of attendees as did occur on Saturday. However, there was steady traffic during the late afternoon. Based on those observations and structured extrapolations, there was a total of at least 34,888 attendees for the three-day outdoor portion of the Zora! Festival in 2012. In three days, about 2/3 (64.4%) of the all traffic appeared to have been generated on Saturday, followed by Sunday (23.7%) and Friday (11.8%).

6.   Limitations and Future Research

There are several important limitations for our analysis as follows;

6.1   Limitations

- Extrapolation of the 15 minutes observation for each 60 minutes

This issue comes from structure of the observation, which we followed the preceding work by Tyrell and Ismail (2005). A few years passed since the study but the framework remains valid due to difficulty for researchers in asking non-paid students to work all hours without any breaks. Thus, researchers have to design a structured compromise to balance the needs for accuracy of data and demand for fair treatment of non-paid volunteer personnel. We believe this method has an external validity to other events in different nations, and remain versatile where accesses to electronic devices or airplanes are not easily available.

- Failure to count local residents who come from back roads and through their own yards leads to underestimation of attendee counts

We cannot control the behaviors and movements of local residents who live in their houses.

- Failure to exclude double-counting of attendees who came from outside, went home and returned to the festival later leads to overestimation of unique attendee counts

This poses a possibility of double counting of the same attendees, while we believe the number of double counting would not be high because such cases are affiliated with local residents, which are not huge for the total number of attendees.

- Failure to count attendees who come through smaller streets, including those who park outside of official parking space leads to underestimation of attendee counts.

Even though population of local residents are not huge, some engage in private parking business by allowing attendees to park their vehicles on their own yards, which pose upward pressure over number of attendees who escaped main entrance points for the event.

6.2   Future Research

Possible future research topics which we did not explore this time include:

- Difference at peak-times over days

There appeared to be difference of peak hours over three days. The peak of Friday appeared to be in the morning during "Education Day," while the peak on Saturday was recorded between 15:00 p.m. and 16:00 p.m. The peak time on Sunday was recorded between 16:00 p.m. and 17:00 p.m.

- Measurement of out-flows at the same observation spots

Due to resource constraints, we could not measure the outflows of foot-traffic at those three cordon lines. In theory, the total numbers of inflow should match that of outflow in a day, but they definitely should show a lag between them. The lag may have some relationship with expenditure amount, satisfaction level and other variables. Since we could not afford to deploy enough numbers of personnel to measure the outflow, this issue would be a subject of future research.

The study confirmed its versatility of a simple and cost-effective measurement method with careful pre-planning, resulted in the first quantitative estimation of attendees for a two-decade old African American cultural festival with direct material costs of approximately US$100. External validity of simple method used by Tyrrell and Ismail, followed by us, would depend on identification and pre-planning of points of major foot traffic flows. Verification of this cost-effective method in other events across continents would increase its versatility to answer a frequently asked question over number of attendees.

References

Armstrong, Ketra L. (2008): Consumers of color and the" culture" of sport attendance: exploratory insights. *Sport Marketing Quarterly, 17*(4), 218-231.

Association to Preserve the Eatonville Community, Inc. (2013). The 23rd Annual Zora Neale Hurston Festival of the Arts and Humanities Is Back! *Press Release Distribution*. http://www.prlog.org/11782083-the-23rd-annual-zora-neale-hurston-festival-of-the-arts-and-humanities-is-back.html

Berlonghi, Alexander E. (1995). Understanding and planning for different spectator crowds. *Safety Science, 18*(4), 239-247. doi: http://dx.doi.org/10.1016/0925-7535(94)00033-Y

Burdekin, Richard CK, & Idson, Todd L. (1991). Customer preferences, attendance and the racial structure of professional basketball teams. *Applied Economics, 23*(1), 179-186.

Evans, G. (1996). Planning for the British Millennium Festival: Establishing the visitor baseline and a framework for forecasting. *Festival Management and Event Tourism, 3*(4), 183-196.

Google Maps. (2015, October 13, 2015). Google Maps represents the location of the East Kennedy Blvd in Town of Eatonville. *Google Earth.* 2014, from https://www.google.com/maps/place/Eatonville,+FL/@28.6158796,-81.3817664,1001m/data=!3m1!1e3!4m2!3m1!1s0x88e7704bc85d2a59:0xef081959cc533266!6m1!1e1

Griffith, Daniel A. (2010). An analytical perspective on sporting events attendance: The 2007–2008 US NCAA college bowl games. *Applied Geography, 30*(2), 203-209. doi: http://dx.doi.org/10.1016/j.apgeog.2009.01.005

Iannaccone, Laurence R, & Everton, Sean F. (2004). Never on sunny days: Lessons from weekly attendance counts. *Journal for the Scientific Study of Religion, 43*(2), 191-207.

Kelly, Joe, Williams, Peter W., Schieven, Arlene, & Dunn, Ian. (2006). Toward a Destination Visitor Attendance Estimation Model: Whistler, British Columbia, Canada. *Journal of Travel Research, 44*(4), 449-456. doi: 10.1177/0047287506286718

Lacey, Russell, Sneath, Julie Z, Finney, Zachary R, & Close, Angeline G. (2007). The impact of repeat attendance on event sponsorship effects. *Journal of Marketing Communications, 13*(4), 243-255.

Morgan, Kimberly L., Larkin, Sherry L., & Adams, Charles M. (2011). Empirical analysis of media versus environmental impacts on park attendance. *Tourism Management, 32*(4), 852-859. doi: http://dx.doi.org/10.1016/j.tourman.2010.07.010

Mules, Trevor, & Dwyer, Larry. (2005). Public Sector Support for Sport Tourism Events: The Role of Cost-benefit Analysis. *Sport in Society, 8*(2), 338-355. doi: 10.1080/17430430500087864

Raybould, Mike, Mules, Trevor, Fredline, Elizabeth, & Tomljenovic, Renata. (2000). Counting the Herd. Using Aerial Photography to Estimate Attendance at Open Events. *Event Management, 6*(1), 25-32.

Regazzoni, Carlo S., & Tesei, Alessandra. (1996). Distributed data fusion for real-time crowding estimation. *Signal Processing, 53*(1), 47-63. doi: http://dx.doi.org/10.1016/0165-1684(96)00075-8

Regazzoni, C. S., Tesei, A., & Murino, V. (1993, 15-19 Nov 1993). *A real-time vision system for crowding monitoring.* Paper presented at the Industrial Electronics, Control, and Instrumentation, 1993. Proceedings of the IECON '93., International Conference on.

Seidler, John, Meyer, Katherine, & Gillivray, Lois Mac. (1976). Collecting Data on Crowds and Rallies: A New Method of Stationary Sampling. *Social Forces, 55*(2), 507-519. doi: 10.2307/2576239

Smith, Timothy M, Hama, Kazuyo, & Smith, Paul M. (2003). The effect of successful trade show attendance on future show interest: exploring Japanese attendee perspectives of domestic and offshore international events. *Journal of Business & Industrial Marketing, 18*(4/5), 403-418.

Tyrell, B., & Ismail, J. (2005). A methodology for estimating the attendance and economic impact of an open-gate festival. *Event Management, 9*(3), 111-118.

Wakefield, Kirk L. (1995). The pervasive effects of social influence on sporting event attendance. *Journal of Sport & Social Issues, 19*(4), 335-351.

Watson, Ray, & Yip, Paul. (2011). How many were there when it mattered? *Significance, 8*(3), 104-107. doi: 10.1111/j.1740-9713.2011.00502.x

Yip, Paul S. F., Watson, Ray, Chan, K. S., Lau, Eric H. Y., Chen, Feng, Xu, Ying, . . . Liu, Danping. (2010). ESTIMATION OF THE NUMBER OF PEOPLE IN A DEMONSTRATION. *Australian & New Zealand Journal of Statistics, 52*(1), 17-26. doi: 10.1111/j.1467-842X.2009.00562.x