

# **The Bank of America Chicago Marathon**

## **Medical Volunteer Allocation Handbook**

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## General Overview

The Bank of America Chicago Marathon, which takes place in early October every year, is one of the six World Marathon Majors and hosted 45,000 runners and 1.7 million spectators last year. The Chicago Marathon has become increasingly popular as it is one of the flattest and therefore fastest road races in the world. Marathoners from all over come to set their personal records, and qualify for other marathons at the Chicago Marathon. Due to the Chicago Marathon's popularity, diversity in runners, and competitive nature, it is important the marathon has a good plan in place for its medical volunteers as injuries are frequent.

One of the challenges is correctly staffing the event, especially with medical volunteers. Tragedies such as the heat wave in 2007 and the bombing of the Boston Marathon in 2013 have served as calls to optimize the preparation and allocation of medical staff in order to ensure the safety of those involved with the event. Last year 1,200 people signed up to volunteer at the marathon but approximately 15% of those volunteers did not show up the morning of the event. With 20 aid stations and 2 larger medical tents scattered throughout the course, it is imperative to the success of the event that all of the tents, especially those in high demand areas, are well staffed throughout the marathon, and that the volunteers are allocated both adequately and efficiently.

The following guide will help the organizers of the Chicago Marathon efficiently recruit, assign, check-in, allocate, and track the medical volunteers the weeks leading up to and the morning of the Bank of America Chicago Marathon. Appendix C provides the methods and analysis that validate our recommendations.

## Before the Marathon

### A. Recruitment

Recruitment of medical volunteers starts about 4 months in advance of the marathon in June. Recruitment practices that are currently in place should be continued.

### B. Assignment/Creation of General Pool

In previous years, volunteers have not been preassigned to aid stations or medical tents after registering to volunteer. For the new system we propose that some of the volunteers are preassigned to locations before arriving at the marathon. The pre-assignment should take place 1 month prior to the marathon. In order to better track all medical volunteers as well as maintain the proper staffing distribution, we recommend allocating 20% of all medical volunteers recruited to a general pool that's designated to be pulled from when no-shows leave holes in the volunteer minimums needed for any medical station located outside of Grant Park. The attrition rate is around 15% given the data we were given, therefore we are bumping the 15% to 20% in order to add a safety net in case of

#### Quick Facts

- Preassign medical volunteers to aid stations
- 20% of the volunteers should be placed in the general pool
- Pre-assignment should take place 1 month prior to the marathon
- Volunteers assigned to aid stations should roughly follow Appendix D

bad weather or other factors that could lead to more than anticipated no-shows. Going forward we recommend collecting data on attrition rates for the coming marathons and adjusting the general pool benchmark based on a moving average.

After 20% are allocated to the general pool, the rest of the volunteers should be preassigned to work at a certain aid station. The pre-assignment should generally follow the recommended number of people that are needed at the aid stations (Appendix D). These numbers have just been between 7-10 volunteers per station in the past, but we recalculated that number given the distribution of injuries at aid stations.

The reasons for pre-assigning and for creating a general pool are to reduce the confusion the morning of the marathon. Volunteers who have been preassigned will know exactly where they need to go. Members of the general pool will serve to combat the attrition rate that is usually observed in volunteers. For example if a MD is assigned to Aid Station 1 and the morning of the marathon does not check in, a MD from the general pool can quickly replace the absent doctor. The reason we don't preassign everyone is because then it is possible everyone from one aid station does not show up which would cause a hectic shuffle the morning of the marathon. More information on the actual allocation of the general pool can be found later in the report.

### *C. Reminders and Follow-up*

In the current system, volunteers sign up for to aid at the marathon in June for an October marathon. This huge gap between committing to the marathon and actual showing up to the marathon is a reason for the high attrition rate for medical volunteers. Nurses shifts are often not scheduled until days or weeks before their shift so it is hard for nurses, doctors and other volunteers to know they will surely be available on a Sunday 4 months in advance. We recommend that the Chicago Marathon team send out monthly email reminders to the volunteers that have registered. These reminder emails will also help because volunteers who find out that they can not make it will be able to inform the staff rather than just not show up the day of the marathon. These emails can also serve a dual purpose to inform volunteers of any preliminary information regarding the marathon including their assignments.

## **Day of the Marathon**

Some of the largest inefficiencies that we found in the current process take place on the morning of the marathon. Currently, all the medical volunteers "get to where they need to be" but the process in which everyone is sorted the morning of is extremely hectic and can be improved upon. The following are steps we recommend to make the process clean and more efficient. A list of steps and their times can be found in Appendix B.

### *A. Initial Volunteer Check-ins*

Currently, volunteers arrive and begin checking in around 5:00 AM the morning of the marathon. Volunteers initially check in at the Hilton Chicago and receive their credentials and t-shirts. Volunteers then go across the street to the Balbo Medical Tent and check in again to receive their vests and assignments before Dr. Chiampas gives the morning welcome speech. Our team agreed that eliminating this second check in and moving the welcome speech to the Hilton Chicago was the most efficient way to approach volunteer check in.

In the new system, volunteers will arrive and begin checking in at 5:00 am at the Hilton. There should be between 15-20 people checking the volunteers in. During this check in, the volunteers will receive their credentials and t-shirts but will also pick up their vests (noting their position). Because many of the people have already received their assignment they should be reminded of that assignment at check in and marked that they are here for their post in the volunteer tracking system. The volunteer tracking system will keep track of the number of volunteers at every station by position (see Appendix E). Using this system it will be easy to see if there is a shortage at a certain station. If a shortage does occur, a member of the general pool will be located in that station (see section C. General Pool Allocation for more information). After volunteers have checked in they should gather with their teams and enjoy coffee and light refreshments prior the the welcome speech which will occur at 5:45.

**Quick Facts**

- Check-in begins at 5 AM, volunteers pick up shirts, credentials, and vests at the Hilton
- No secondary Balbo check-in
- 15-20 people should assist with check-in
- Light breakfast and coffee for volunteers who have already checked in served at Hilton

*B. Volunteer Kickoff*

The Marathon kick off speech currently occurs in Balbo Medical Tent. Because the volunteers are no longer going to Balbo to re-check in, the speech should now occur in the Hilton. Based on availability of conference rooms, volunteers should gather and listen to the medical lead's (currently Dr. Chiampas) speech. The speech should begin at 5:45 am and last no longer than 5 minutes. Ideally most volunteers will be checked in by the speech but check in should still be open.

*C. General Pool Allocation*

When volunteers haven't shown up to the marathon in the past, staffing leads would fill their holes by taking volunteers that are near them with little to no consideration towards their current role and the hole they are forming somewhere else in the system. With this new system the general pool is used to fill the void of an absent assigned volunteer. In this new system as medical leads take attendance and collect their volunteers to organize and load the buses for their designated medical station, the leads will take the specified volunteer - or medical volunteer that has the missing skillset equivalent - that they are missing from their team due to a no-show or late arrival. Any volunteer that is taken from the general pool should then be marked appropriately in the volunteer tracking system to guarantee that no-shows are filled the morning of the event and to monitor the general pool's capital to prevent it from being drawn dry. Any volunteers then that are not reallocated the morning of the event will be assigned somewhere in Grant Park due to the medical stations all be located in walking distance from the Hilton and therefore no need to be driven to another station. The medical stations in Grant Park are also always in need for more volunteers and have the space to fit the extra labor force that the general pool will add to the stations after they've been pulled from. The reallocation process should begin immediately after the kickoff speech and be done at the latest by the time when certain groups are heading down to their busses. The volunteer reallocation should begin immediately after the kickoff and last no longer than 10-15 minutes.

**Quick Facts**

- Volunteer reallocation begins at 5:50 am after the kickoff
- Should be easy to fill holes using Volunteer Tracking System (Appendix E)
- Members of general pool who are not reallocated will proceed to Grant Park to either Balbo or another Grant Park assignment

#### D. Departure to Medical Aid Stations

The new process of departing for the medical stations across the race is going to work almost identically to the current method, the only true change is the departure location: now from the Hilton rather than from Balbo medical. We suggest parking all of the buses/vans used for transporting the teams of volunteers on Michigan Avenue outside of the main doors of the Hilton. With travel times from the kickoff to the loading centers outside of the Hilton, we suggest teams to begin travelling to the loading center five minutes before scheduled departures as shown in appendix B along with all recommended departure times for every group of medical volunteers from the Hilton. See Appendix B for a robust recommended departure schedule to ensure a fluid process that guarantees every medical volunteer to reach their designated medical station with ample time before the race begins. Departure is by group of aid stations. A list of which tents are in which group can be found in Appendix D.

##### Quick Facts

- Busses will be waiting outside of the Hilton to transport volunteers to aid stations

- Volunteers should follow the departure table found in Appendix B

- Staff should make sure they are only leaving during their time or elevators will become a bottleneck

#### Final Recommendations and Next Steps

The Bank of America Chicago Marathon is an extremely popular and important event for the City of Chicago. The preparedness of Medical Volunteers is especially important to the success of the event. Using our statistical simulation, we found it to be extremely beneficial for there to be only one check in and have that check in be at the Hilton. We also believe the implementation of pre-assigning volunteers and having a general pool to “pull from” in the case of absences will greatly decrease confusion the morning of the marathon. Adding these recommendations should help with the overall efficiency of the event. In order to continue improving however, we recommend that the Chicago Event Management team do a few things.

One future step should be to develop a Medical Volunteer Tracking System (similar to Appendix E) in order to be able to visualize in real time how many people need be at a certain place. This will make allocating the general pool significantly easier. The marathon already has a runner tracking system which they use and having a volunteer tracking system can come in handy in case there is an emergency.

Finally, we recommend that data continue to be collected. Our recommendations for number of volunteers at certain stations (Appendix D) is only based on data from the 2014 marathon. The more data that is collected on runner injuries at aid stations will help to create a better model for volunteer staffing for the marathon. This will ensure that patients are being treated as quickly and efficiently as possible and that the medical volunteers aren't over or under utilized.

## Appendix A: Process Diagrams for Current and Proposed Volunteer Allocation Systems

Exhibit 1: Process of the Months Leading to the Marathon

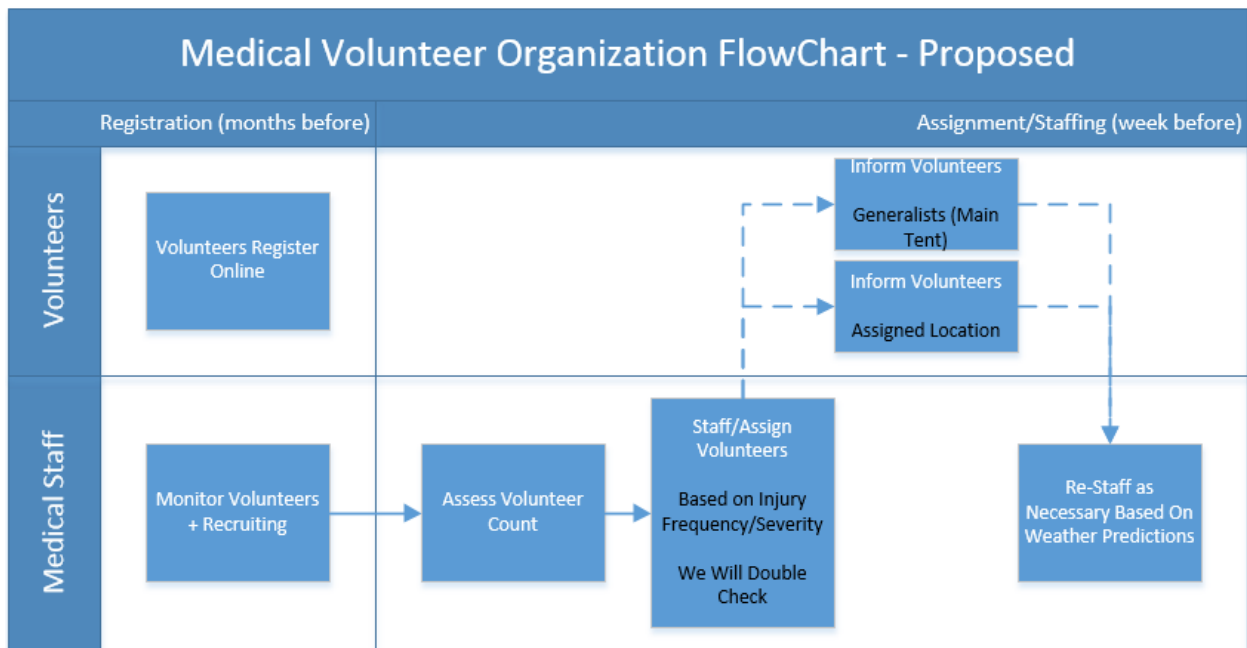
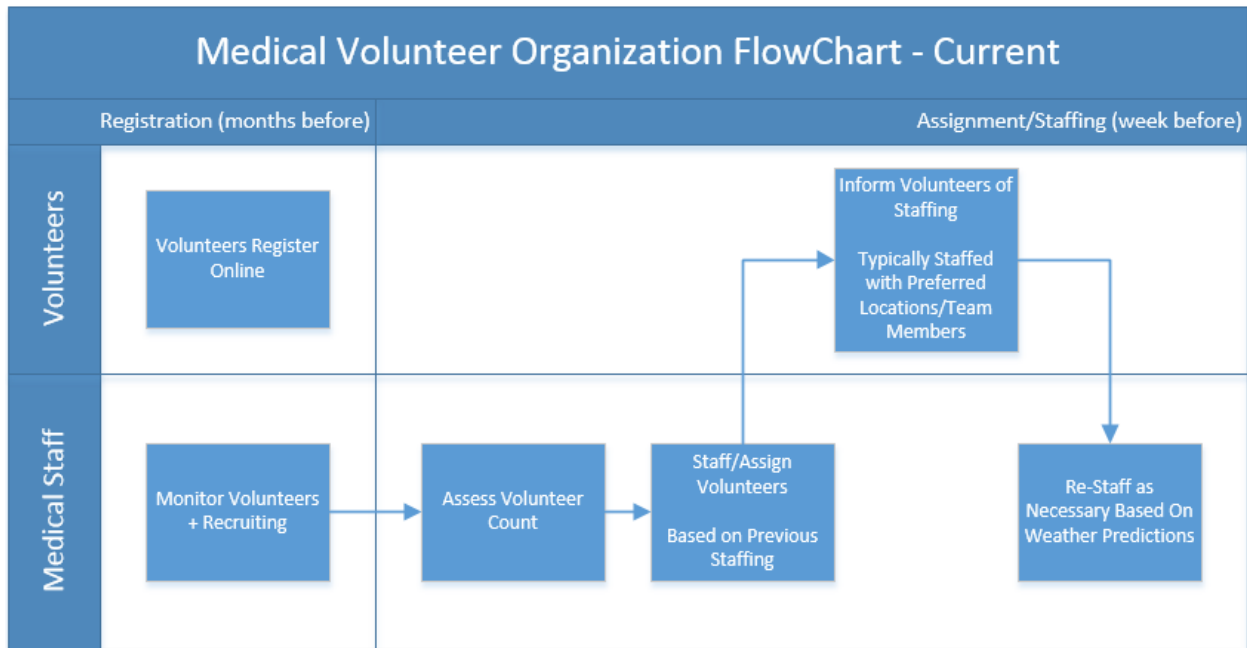
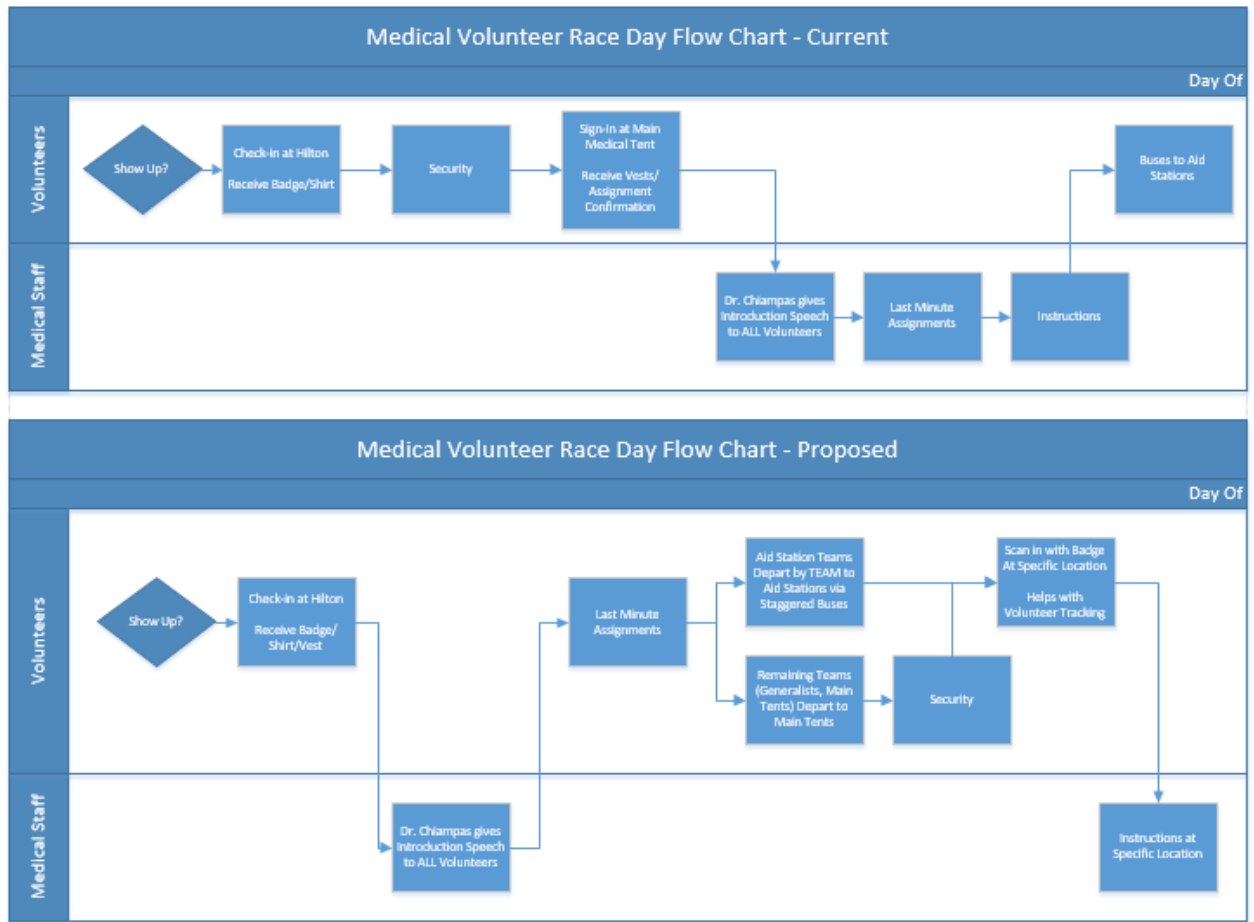


Exhibit 2: Process of the Morning of the Marathon



## **Appendix B: Schedule of Events for Morning of Marathon**

5:00 AM - Volunteer check-in begins, refreshments are available

5:45 AM - Medical Volunteer kick-off meeting begins

5:50 AM - Group reallocations from general pool are carried out and groups gather

6:00 AM - Final check with groups, Grant Park and Balbo volunteers depart for security

6:05 AM - Group 1 heads down to Runner Transport System (RTS) vans

6:10 AM - Group 1 departs for Aid Stations 1-5, Group 2 heads down to RTS vans

6:15 AM - Group 2 departs for AS 6-11, Group 3 and Laflin staff head down to RTS vans

6:20 AM - Group 3 (AS 12-15) and Laflin depart, Group 4 heads down to RTS vans

6:25 AM - Group 4 (AS 16-20) departs



## **Appendix C: Methodology and Analysis for Recommendations**

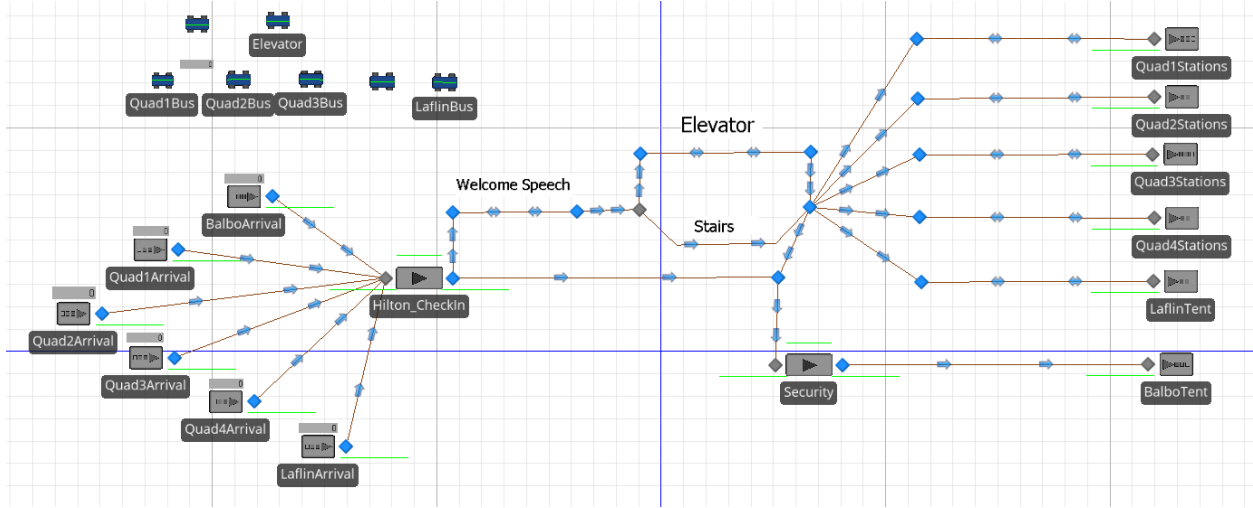
Before recommending these changes, we had to ensure that they were all feasible. In order to check the feasibility of these recommendations, we created a simulation model of the current system that used all the data we possessed about the current setup of the medical volunteer morning check-in on the day of the marathon. In this model, volunteers enter the system, go through check-in, and then travel to the Balbo medical tent, going through security on the way. From Balbo, people are sent out to the locations they will work at for the rest of the marathon. Using this model, we validated the assumptions in our model and ensured that the system timeline matched the race day schedule that we had access to.

In order to test the changes we wanted to make to this check-in process, we started to change the model to include our changes. People continued to check-in at first at the Hilton, however instead of proceeding to the Balbo Medical Tent immediately, they stayed at the Hilton until the medical kick-off meeting held at 6:00 AM. After this kick-off meeting, the volunteers proceed down to the first floor, where volunteers are dispatched to their aid stations using the Runner Transport System (RTS). Those volunteers assigned to the Grant Park area, including extra pooled volunteers and the Balbo Medical Tent volunteers, walk over to their assignments in Grant Park and go through security.

With these changes completed, we ran the simulation with the same initial conditions that we used in order to validate our model of the current system. With these conditions, we confirmed that the Hilton Model would be feasible if all other conditions remained the same. However, the spike in traffic moving through security caused by volunteers moving through security in a large group rather than sporadically throughout the hour led to a 34% increase in the amount of time it took an individual volunteer to move through security. Because this project is about increasing the efficiency of the system and improving the experience for the volunteers, we wanted to see what we could do in order to reduce the impact of this change. We discovered that by adding one additional line for volunteers to go through security in at the checkpoint during this peak period, volunteers would experience the same average waiting time as they do in the current system. Also, because of the predictability of this spike in demand at the security checkpoint, there is no need to hire more security personnel, and instead you could rotate a few personnel over during the peak period who could quickly return to their designated jobs after the completion of the peak period.

In addition, we analyzed the amount of staff needed at the check-in counter to be able to process the arrivals in time for the system to be completed. We determined that the ideal number of servers depends on the expected amount of people who will be arriving within the 5:00AM to 6:00AM period. If the total number arriving in the system is less than 550 people, 15 people can adequately staff the check-in desk. However, for a larger expected number of arrivals, we recommend an increase to 20 people at the check-in desk to ensure that volunteers are quickly checked in and have adequate time to eat and talk to associates before the kick-off meeting begins.

An image of our final Simio model is below.



## Appendix D: Medical Volunteer Allocation at Aid Stations

The following shouldn't serve as the final decision for volunteer allocation as the recommendation is only based on 2014 marathon injury data. Also the recommendation is based on quadrants, the aid stations are divided into quadrants by the Chicago Marathon based on location. The percentage is percent of volunteers that need to be allocated to aid stations, not percent of volunteers total. Balbo, sweep team, and other medical volunteers can also be preassigned.

		Percent Volunteers Allocated
Q1	Aid Station 1 - State St / Randolph St.	11%
	Aid Station 2 - LaSalle St. / Ohio St.	
	Aid Station 3 - Stockton Dr.	
	Aid Station 4 - Cannon Dr. / Fullerton Dr.	
	Aid Station 5 - Broadway St. / Aldine Ave.	
Q2	Aid Station 6 - Clark St. / Belden Ave.	37%
	Aid Station 7 - Wells St. / Schiller St.	
	Aid Station 8 - Wells St. / Grand Ave.	
	Aid Station 9 - Franklin St. / Washington St.	
	Aid Station 10 - Adams St. / Racine Ave.	
Q3	Aid Station 11 - Ogden Ave. / Van Buren St.	29%
	Aid Station 12 - Sangamon St. / Jackson Blvd.	
	Aid Station 13 - Taylor St. / Racine Ave.	
	Aid Station 14 - Loomis St. / Blue Island Ave.	
Q4	Aid Station 15 - Halsted St. / Canalport Ave.	24%
	Aid Station 16 - Archer Ave. / Wallace St.	
	Aid Station 17 - 29th St. / Wentworth Ave.	
	Aid Station 18 - 34th St. / Michigan Ave.	
	Aid Station 19 - 28th St. / Michigan Ave.	
	Aid Station 20 - 18th St. / Michigan Ave.	

## Appendix E: Volunteer Tracking System

1. All volunteers are given badges upon Check In at the Hilton.
2. Once they receive these badges, they will be scanned into the system, marking their presence.
3. As people congregate in the Hilton, EMOS will track which volunteers have signed in, along with where they are staffed and what category of volunteer they are. This will allow monitors to track which volunteers are signed in, and which stations may be understaffed in real time.
4. As monitors read this data, they can relay this information to team leaders prior to buses departing from the Hilton on the way to aid stations.
5. Upon arrival at aid stations, volunteers will again be asked to Scan In at their respective station, indicating in the system that they have physically arrived at their assigned spot. Once again, this will show in real time.

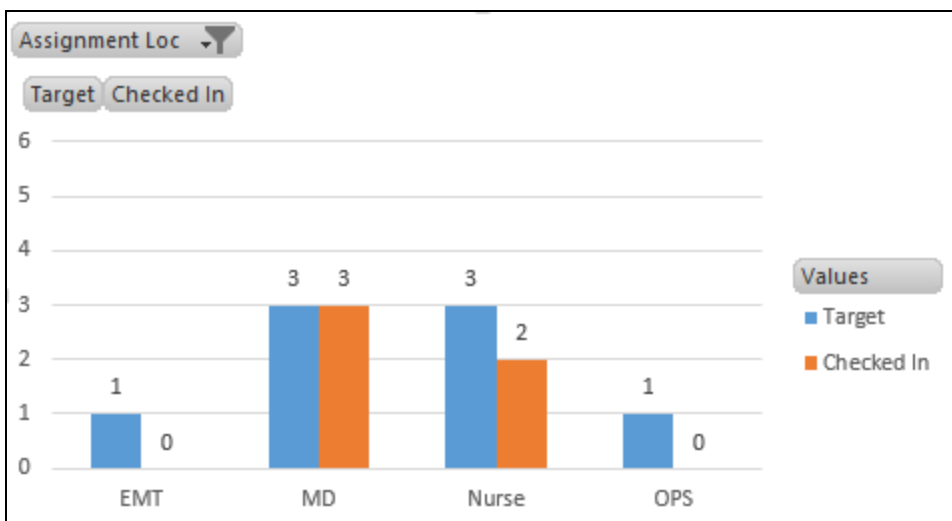
Upon each scan of the badge, a "Signed In" Indicator will be added real time to the person's name and information (Category of volunteer and location).

This indicator will be used to create real time graphs.

Below are screen captures of what the system may look like.

Name	Category	Location	Sign In?
Jim	MD	Balbo	1
Joe	EMT	2	1
Kyle	Ped	1	1
Sid	Nurse	15	1
Taylor	EMT	15	0
Greg	MD	12	1
Spence	MD	Balbo	1
Tim	EMT	5	1
Fred	Nurse	4	1

Assignment Loc	Balbo	
Row Labels	Target	Checked In
EMT	1	0
MD	3	3
Nurse	3	2
OPS	1	0
<b>Grand Total</b>	<b>8</b>	<b>5</b>



Having this volunteer tracking system will make it extremely easy to find out where to allocate the members of the general pool the day of the marathon.