

## **THE TRUST FOR PUBLIC LAND**

**NEW YORK CITY PLAYGROUNDS PROGRAM**

### **SCHOOLYARD PLAYGROUND EVALUATION**



## **FINAL REPORT**

**JANUARY 28, 2011**

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## EXECUTIVE SUMMARY

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ActKnowledge conducted an ongoing evaluation of the New York City Playgrounds Program at three sites: P. S. 242 in Manhattan, P. S. 93 in the Bronx; and I. S. 73 in Queens; from May 2007 through October 2009. The three sites were hoped to be broadly representative of the entire project. Lessons learned from evaluation here can inform decision making at all NYC Playgrounds Program sites. The evaluation research was designed to find out how the kinds of users, numbers of users, and uses of the schoolyards may have changed as a result of the project. Research methods included structured observations of the schoolyards at the three sites, interviews with school administrators and after-school program people, and informal conversations with users and neighbors onsite and off site. All these methods were applied before construction and then again after construction.

### SIGNIFICANT FINDINGS

#### School-Day and After School

Based on the three sites in our study the Playgrounds Program has achieved the greatest usage increase among the school population. The potential users are all right there onsite and the beautifully rebuilt schoolyards entice children and adults alike. Table 1 shows the growth in the school-day (including after-school) schoolyard visits: more than doubling at both P.S. 93 and I.S. 73, and modest increases at P.S. 242.

TABLE 1  
ANNUAL SCHOOL DAY AND AFTER SCHOOL ESTIMATED TOTAL SCHOOLYARD VISITS

		Pre- Construction	Post- Construction
PS 242 Harlem	Large Yard	50,000	53,500
	Small Yard	18,000	27,500
PS 93 Soundview		24,900	57,600
IS 73 Maspeth		37,000	83,800

Factors influencing the totals in Table 1 include size of enrollment and size and preconstruction condition of the yards. P. S. 93 has the largest yard and the smallest enrollment of the three; I. S. 73, conversely, has a small yard and a large enrollment. P. S. 93's schoolyard can accommodate more people comfortably but its small enrollment limits the numbers of users. Preconstruction conditions were significantly better at P. S. 242, which had jungle gyms, seating, and water, than at the other two sites. Significantly, one of the constituent schools at P. S. 242 used the yards heavily before construction as well as after.

## Community Use

The project has achieved significant increases in community use.

TABLE 2  
COMPARATIVE POPULATION ESTIMATE PRE- AND POST-CONSTRUCTION

	PS 242 Large Yard		PS 93		IS 73	
	Pre-Construct- ion	Post-Construct- ion	Pre-Construct- ion	Post-Construct- ion	Pre-Construct- ion	Post-Construct- ion
School day and after school	50,000	53,500	24,900	57,600	37,000	83,800
Community	-	5,000	7,800	13,400	3,000	10,400

Among community users, the greatest proportional increase is at P.S. 242, where community access went from negligible to an estimated 5,000. With better access in the future the usership could be much higher. P.S. 93 has the largest absolute numbers before and after construction and the smallest proportional increase, from 7,800 to 13,400 user visits. At I. S. 73, the numbers in our estimates have more than tripled, from only 3,000 to 10,400 user visits per year.

Public space usage involves a dynamic interaction between the “pull” of supply and the “push” of demand. On the supply side we have the “If you build it they will come” ideal of a beautiful new facility that attracts droves of happy users. We found that ideal most closely fulfilled at P.S. 93, where 100 or more people at a time were using the schoolyard on nice early summer evenings. Issues that mediate the push of demand include inconsistent open hours and fears for safety. P. S. 242 has been very inconsistent. Reliable access is a critical factor in community use: if the schoolyard is locked, people are not going to use it. If the yard is supposed to be open but in fact is locked when people expect it to be open or if its hours are very limited, people seeking to use may give up and go elsewhere.

In relatively safe neighborhoods, at least, the pull of the new yards and the push of demand for public outdoor space has yielded big increases in the amount and variety of use. In some locations, e.g., P. S. 242, staffing and programming may need to be part of the mix.

## More Girls

At all three sites, the proportion of girls among persons observed increased more rapidly from pre- to post-construction (Table 3).

- At I. S. 73, where girls were less than 10 percent of observed users before construction, they were 34 percent in 2009, a year after the playground reopened.
- At P. S. 93, girls increased from 37 percent to 43 percent of the total.
- At P. S. 242, girls, already at 42 percent, increased to 57 percent—i.e., girls became a majority of the persons observed.

We think the increase in girls is related to the increase in unstructured uses, described below, on grounds that higher proportions of girls than boys engage in unstructured activities.

TABLE 3  
OBSERVED DATA BY SEX AND FORM OF PLAY

		Female	Male	Total	Percent female		Struct- ured	Unstruct- ured	Total	Percent unstructured	
IS 73	2007	22	225	247	0.09	9%	187	60	247	0.24	24%
	2009	501	957	1,480	0.34	34%	697	762	1,459	0.52	52%
PS 93	2007	329	570	899	0.366	37%	632	267	899	0.30	30%
	2008	709	953	1,662	0.4266	43%	605	1062	1,667	0.64	64%
PS 242	2007	338	426	814	0.4152	42%	483	331	814	0.41	41%
	2008	428	317	745	0.5745	57%	336	409	745	0.55	55%

### More Unstructured Activity

As shown in Table 3, above, unstructured uses increased phenomenally from pre- to post-construction. Unstructured uses went from 24 to 52 percent of all observed uses at I. S. 73; from 30 to 64 percent at P. S. 93; and from 41 percent to 55 percent at P. S. 242 (large yard). The school and after-school officials we interviewed expressed a preference for organized, adult-recognized forms of play. Officials all found spontaneous play wanting and agreed that the rebuilt schoolyards would enhance and increase their ability to offer organized games. While the new schoolyards have met that hope, as organized games can now be played in greater number and variety, much more of the overall increase in schoolyard use can be attributed to the unstructured activities. The combination of seating, soft surfaces, and synergies resulting from the spatial arrangement of circulation routes and different active and passive activity zones has made the yards at all three sites much more attractive to socializing, talking, hanging out, jungle gym play, sitting and lying on the grass, and other “unstructured” forms of play. This unstructured activity is valuable in itself and very supportive of the structured recreation that officials prize.

### Choosing the Right Community Partner

We raise the question of what makes the ideal community partner. If the playgrounds program's highest priority is community use, then the community partner should be an organization whose mission involves community development. The program's community partners include schools and CBOs. One would expect a public or charter school to be an effective advocate for school-day uses but not for general community use. A CBO like Maspeth Town Hall, the partner at I. S. 73, should be the right partner, but MTH seems to limit its role at 73 to that of after-school program provider. Harlem Children's Zone, for example, might have been a better community partner for the P. S. 242 schoolyard than the Future Leaders Institute charter school because sponsoring community activity belongs within their mission and they run weekend activities at the P. S. 242 site, just not in the schoolyard. Ideally a community partner would already have community programs and activities which they could relocate to

the schoolyard. Harlem Children's Zone has done some good things at P. S. 242 but not consistently. If they were under contract as a community partner they might have been more consistent in anchoring and promoting community use of the yard.

The Trust for Public Land undertook the New York City Playgrounds Program in collaboration with the New York City Department of Education and various community-based organizations active at each site. The project includes a participatory design process involving mainly students and professional designers, leading to construction of new playground facilities in place of simple blacktopped, fenced schoolyards. The rebuilt schoolyards typically have play equipment, artificial turf for football and soccer, a running track, seating, trees and other plantings, basketball courts, and other features and amenities. TPL seeks to achieve both a richer school day experience for students and a community park resource for residents to gather, play, and socialize. Of the more than 50 sites where the program is active, TPL selected three for evaluation by ActKnowledge, an independent research firm. The three sites were hoped to be broadly representative of the entire project and that lessons learned from evaluation here could be applied to decision making at all NYC Playgrounds Program sites.

TPL is interested in learning how the kinds of users, numbers of users, and uses of the schoolyards may have changed as a result of the project. This report provides a comparative analysis of the changes at three sites.

### **Participatory Design**

Schoolchildren were involved in the preliminary design phase. Children who wanted to participate could think about the yard and the needs of the school population. During facilitated sessions with school staff and other adults, they were shown the kinds of things their yards could have—all the possible types of facilities, furnishings, and surfaces. They worked with the adults to choose how many and how much of each thing to put into the design program. Children got to think about the layout of the new spaces too: which facilities to put where, and how the circulation would work. As work progressed through the design development and final design phases, students continued to have advisory input.

### **Partner**

At each site TPL had partners to co-sponsor the playground program. One partner was the school itself. Many sites have more than one school in the building, which may lead to having formal partner roles for more than one of the schools on the site. Such was the case at the Harlem site we studied, P. S. 242/Future Leaders Institute. TPL also sought a “community partner”, or community-based organization that would represent the after-school and community stakeholders.

### **Purpose**

The Playgrounds Program seeks to provide a safe play space within a ten-minute walk of every New York City child. In selecting sites it concentrates on areas underserved by existing parks and playgrounds. Although the most obvious benefit redounds to the school population, the program’s real focus is city children who may not be students at that school. TPL’s partners at any given program site accept responsibility for running programs at the schoolyards and for working to keep the yards open to the public after school and on weekends. TPL wants the schoolyards to become vibrant, safe community parks, well used by children and their families.

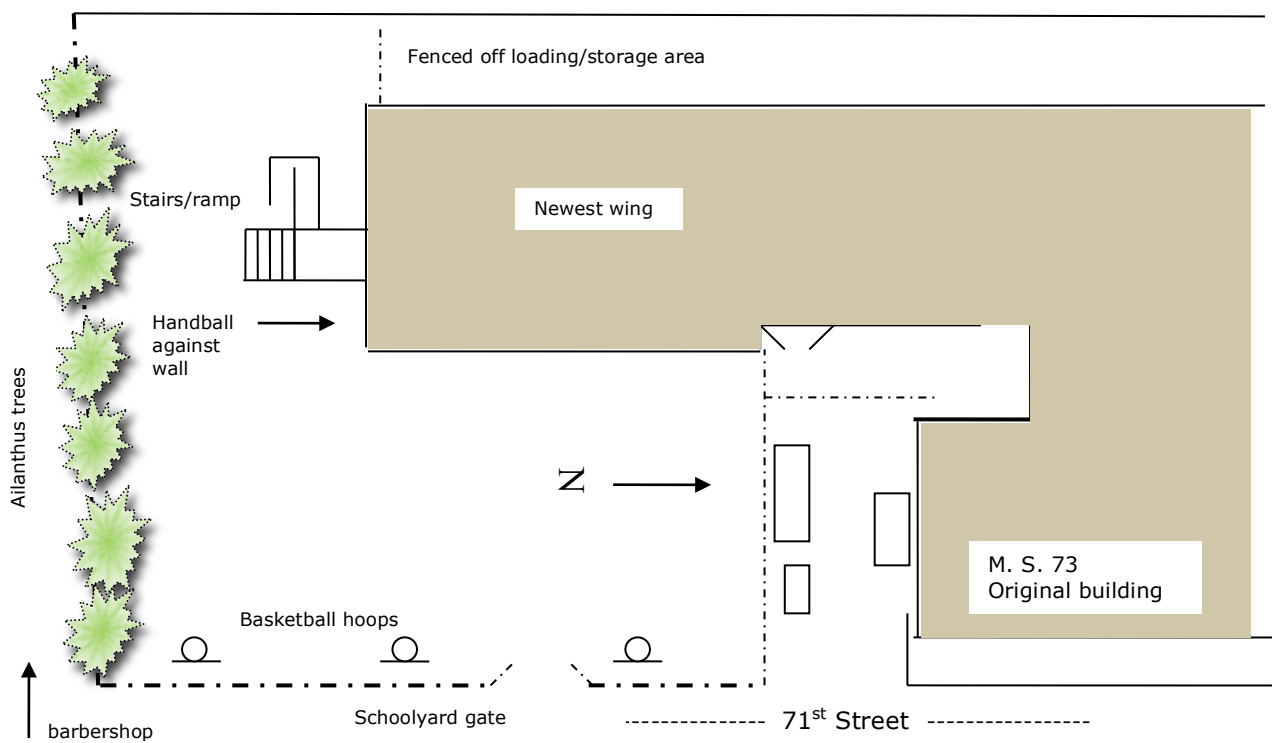
## Continuing Involvement

TPL has ongoing involvement with their program partners even after construction is completed. Part of the planning process involves working out solutions for care and maintenance of the yards once they reopen. TPL works with partners to solve problems relating to facility maintenance as well as public access and utilization.

## THE SITES

### I. S. 73

Intermediate School 73 occupies a portion of the block of 71<sup>st</sup> Street between Grand Avenue and 54<sup>th</sup> Avenue in Maspeth, Queens. Enrollment is about 1,700 and the school has grades 6 through 8. At one time the school had a reasonably large schoolyard lying beside (to the south of) and behind (west of) the school building. Subsequent additions to the building have left a much smaller yard.



**I. S. 73 Schoolyard Before Construction**

Prior to construction:

- Blacktopped expanse bordered by high fences on three sides.
- Three basketball hoops mounted along the 71<sup>st</sup> Street edge

- Volunteer trees (Ailanthus and others) growing in back yards on the other side of the fence shade the south side.
- Long, narrow space on west side fenced off and used for loading and storage

While there was no formal seating, students sat on the stairway/wheelchair ramp and on the smaller steps into the building between the old and new wings.

After Construction:

- Turf sports field and running track
- Three new basketball hoops on the south side
- Seating with tables and a gazebo on the south side near the basketball hoops and along the 71<sup>st</sup> street edge
- Play structure in the southwest corner
- Outdoor classrooms in the alley
- Water fountain

## **P. S. 242 / FLI**

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Public School 242 is located on West 122<sup>nd</sup> Street in Harlem, on Manhattan Island, between Lenox and Seventh Avenues. This comparatively modern, low-rise building contains three schools: P.S. 242, Future Leaders Institute (FLI), and Harlem Link. The first two are TPL's partners in the schoolyard project. Harlem Link was scheduled to leave the building before the playground opened. The school has two schoolyards, separated by the gym: the main, or large yard for 2<sup>nd</sup> through 8<sup>th</sup> graders, and a small yard for kindergarten and first graders. The two yards are located on the 121<sup>st</sup> Street side of the complex. Both yards are south-facing and thus subject to full sun during the day.

Prior to construction, the large yard had the following characteristics:

- paved in asphalt
- basketball backstops were still in place but with no hoops
- climbing structure with rubber pad in the southeastern corner
- four backless benches complete the furniture.
- morning shade on the east from ailanthus trees growing behind the fence in the backyards on Lenox Avenue
- informal seating along the one-foot-high concrete footing of the perimeter fence along 121<sup>st</sup> Street.

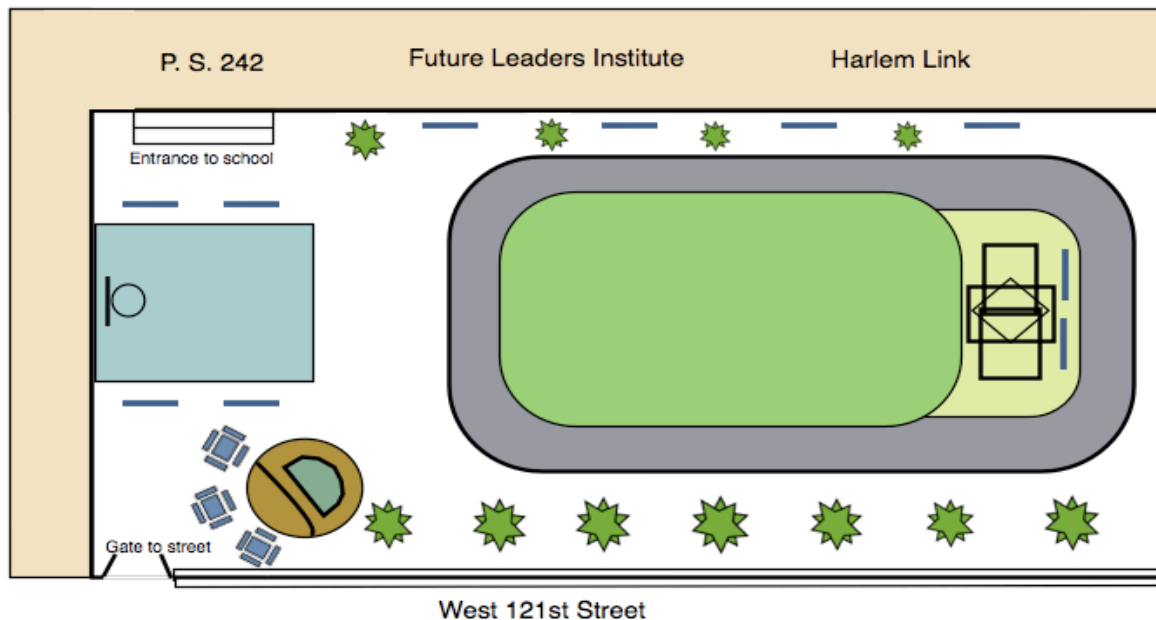


The small yard is directly accessible from the three kindergarten classrooms that border it. Prior to construction it had:

- a climbing structure and rubber pad, located in the western third of the yard.



- a planting strip partially used for gardening between the paved playground surface and the sidewalk, with three or four small or medium-sized trees
- a big shade tree that ironically appears to be a volunteer ailanthus.
- a forbidding array of fences, walls, and locked gates.



### Large Yard, P. S. 242, After Construction

#### Large Yard After Construction

- Removable basketball hoop at west end, by the gate
- Turf sports field and running track
- Outdoor classroom
- Play structure at east end
- Seating, trees, and other play structures
- Informal seating on the footing and shade borrowed from Lenox Ave backyard trees remain.



#### Small Yard After Construction

- Gazebo
- New garden
- New play structure
- Existing trees remain



- New, less prison-like fences

The small yard is reserved for school-day uses only. The gate to 121<sup>st</sup> Street is never open.

### P. S. 93

Public School 93, in the Soundview section of the Bronx, consists of the original L-shaped building dating to the 1930s and a prefab, one-story structure—a “temporary classroom unit”—built in the 1970s along the Elder Avenue side of the yard. As New York City schoolyards go, this is a big one: P. S. 93 has the whole of a standard city block. The school buildings occupy no more than one fifth of the block, leaving ample space for the schoolyard.

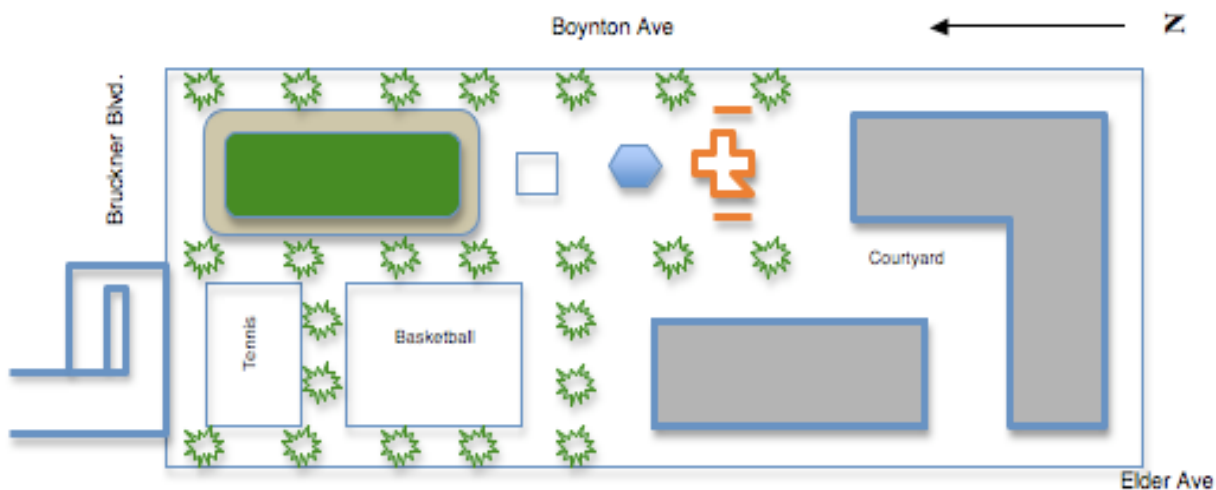
Prior to reconstruction

- the yard was internally differentiated by fencing and a handball wall into several distinct areas.
- Two basketball hoops at the Bruckner Boulevard (north) end of the site
- Lots of pavement



After construction

- internally differentiated now by facilities—jungle gym, soccer field and track, basketball and tennis courts, a stage.
- lots of seating, trees, color, and some shade and soft surfaces.
- Two gates each on Elder and Boynton Avenues



P. S. 93 After Construction

## METHOD

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The research involved structured observations of the three schoolyards at optimal times of the year. At each site we observed activity prior to construction and then returned to make more observations after construction. At public schools 242 and 93, the work was done in May and June. At I.S. 73 the work was done in September, October, and June. We made structured observations during the school day, after school, on weekends and evenings. Observations were recorded on field form designed for the purpose, including numbers by age, sex, and activity. The numerical data was then transferred to Excel spreadsheets for analysis.

We sorted activity as either structured or unstructured activity, reflecting the concerns of school and after-school officials at all three sites who shared a preference for more organized or structured forms of play. In their view, the smooth-surfaced, undifferentiated quantity of space that existed prior to reconstruction accommodated too much unstructured play. They saw the structured courts and fields in the design of the new yards as much more supportive of organized or “structured” play. In our method, structured activity can mean games with established forms of play, rules, competing teams, coaching, and a particular ground or facility where the game is played. Structured activity can even mean informal, child-initiated games like kickball or jump-rope—recognizable games that have some structure to them. School officials thought such structured activity allowed children to let off steam in ways that supported the educational mission of the school. They learn about team play, sportsmanship, excelling as athletes, and so on. Unstructured activity, including spontaneous running and games of tag, was described as less desirable. One assistant principal called recess play “haphazard...I’d like to see it more organized.” We coded all such running/tag, also hanging out, sitting or standing, and talking together as “unstructured”. In post-construction fieldwork, unstructured play included all play on the jungle gym and other fixed play facilities.

We base our estimates of annual usership mainly on prediction factors including school enrollment, the number of recess periods, size of the after-school program, and estimates of good-weather days in the school year. The structured observation data are used mainly to characterize uses of the yard and, to a lesser extent, for estimating usership. See the Appendix for greater detail on the research methods.

## FINDINGS

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The two major groups of users and user outcomes are:

- School-day and after-school population
- Community users

### School-Day and After School

Based on the three sites in our study it has been easiest for the Playgrounds Program to achieve greater usage for the school-based population. The potential users are all right there onsite and the beautifully rebuilt schoolyards entice children and adults alike. While there are differences in use and numbers of users between school-day and after-school users, their use of

the schoolyards is characterized by programmed and supervised activity at specified times. Community use is voluntary, and the level and variety of community use depends much more on the attractive power of the schoolyard. Table 1 shows the growth in the school-day (including after-school) schoolyard visits: more than doubling at both P.S. 93 and I.S. 73, and modest increases at P.S. 242.

TABLE 1  
ANNUAL SCHOOL DAY AND AFTER SCHOOL ESTIMATED TOTAL SCHOOLYARD VISITS

		Pre-Construction	Post-Construction
PS 242 Harlem	Large Yard	50,000	53,500
	Small Yard	18,000	27,500
PS 93 Soundview		24,900	57,600
IS 73 Maspeth		37,000	83,800

These numbers are “person visits” in the sense that the schoolyard users are drawn from the same school-based population day after day. P.S. 93 has fewer annual visits in this estimate than the other two schools. This we attribute to the smaller enrollment there. I.S. 73 has an enormous enrollment and the largest estimated total user visits: if the yard at 73 were larger it would likely have higher numbers. The enrollment at P.S. 242 (including FLI and Link) is in between that of 93 and 73. We estimate use at just under that of I.S. 73 but 242 has more schoolyard space, and so more students can be accommodated outside at a time.

At the Maspeth and Soundview sites, pre-construction activity among the school population was comparatively low. The lack of amenity and facilities pre-construction, especially at P.S. 93 and I.S. 73, kept school based uses very modest in proportion to what followed construction. At both sites the new yards have incentivized much greater use. At P.S. 242 we see modest growth. Both schoolyards there had more facilities and amenities prior to construction, including seating, water, shade, and jungle gyms, and they were well used for recess, outdoor classes, and after-school activities.

Another factor in the modest increase in school-based uses of the 242 yards is that Future Leaders Institute, which is the biggest user of the large yard, used the yard intensively before construction. FLI has a policy of taking students outdoors for various activities. While we think FLI’s use of the large yard has grown somewhat, regular outdoor activity was always part of their approach to education.

Among school-day uses are recess and outdoor classes. Recess involves the highest numbers of any use group and has grown very much in response to the new schoolyards at I.S. 73 and P.S. 93. The renovated yards incentivize outdoor recess: more students want to go outside and more teachers and school aides want to go with them. Outdoor classes have benefited too, especially physical education classes. We did not find much use of the outdoor classrooms at 242 and 73 for class as such. The reason at I.S. 73, at least, is procedural: teachers must plan ahead and go through channels to depart from the indoor routine and mostly they do not take the trouble.

After-school activity has grown as well. In Maspeth, for example, an after-school program worker attributed the doubling of after-school program enrollment to the facilities and amenities of the new schoolyard.

## Community Use

Community users are perhaps the highest priority group for the Playgrounds Program, which seeks to provide city children with a safe place to play 10 minutes or less from home.

Community uses are the least easy to characterize: they can look a lot like an unstructured afterschool program, which is to say, 10 to 25 children and youth with an adult or two, playing ball games, sitting on benches, having fun on the turf, and climbing on the jungle gym. Or community use can be families on a summer night eating food, the children playing ball games.

Table 2 gives an annualized community use population estimate for P. S. 242. Tables 3 and 4 report the corresponding figures for P. S. 93 and I. S. 73.

TABLE 2  
P. S. 242 LARGE YARD: ESTIMATED ANNUAL COMMUNITY USE POST-CONSTRUCTION

	Fair days	Users per day	Sub-total	Rainy/ cloudy/or cool days	Users per day	Sub-total	Cold days	Users per day	Sub-total	Total 2009
Weekends	40	40	1,600	17	20	340	44	8	352	2,292
Weekdays while school is in session	63	10	630	30	5	150	95	3	285	1,065
Summer weekdays, holidays, sch vaca	45	30	1,350	15	15	225	16	6	96	1,671
Total	148		3,580	62		715	155		733	5,028

When we returned to P. S. 242 in spring 2008, the rebuilt schoolyard was fulfilling its potential for the school and after-school community but was no more accessible to the wider community than it had been before construction. We returned again in spring 2009 to find out whether public access had improved and, if so, what kind of community use was going on. This time we relied on asking users and residents questions about the activity and not only on observation. As in 2008, we found that the yard was often locked. On a Saturday in June it was unlocked but we were the only people there. However, locking the yard does not keep everyone out. We asked some junior high school aged boys, who were entering and exiting the locked yard either by scaling the fence or through a tear in the fabric, about summertime use. On two occasions, boys told of substantial summertime use.

The Harlem Children's Zone person with responsibility for coordinating the monitoring at the site said in 2009 only a few people show up; she said the same thing in 2008, which was a basis for our 2008 estimate of 10 users per day. After more probing this year, we think this is not true. One reason may be that the HCZ monitors are not really monitoring; they are not usually out in the schoolyard to welcome people, suggest activity, hand out equipment, or actively

monitor activity. Most weekends they appear to stay inside the building and so are likely unaware of playground activity. The Harlem Children's Zone person we consulted onsite was a young intern who seemed to be more concerned about violating procedure than about the schoolyard as a public space.<sup>1</sup> This young woman said that they sometimes hold events in the yard, and the events do bring in many more people.

A resident of the block who had done much to secure community access to the larger yard described the community activity as sporadic. For the most part, the yard is accessible to the community on weekends in nice weather. A couple of people said it was in full use until 9:00 p.m. summer evenings. One of these added that the yard was sometimes locked up too. In the summer time the yard should be open weekdays as well as weekends, but Harlem Children's Zone monitors may not be active weekdays and the custodians may lock it up once the summer camp activity is over for the day. We guess that the yard is open reliably during weekend hours but that on weekdays one might just as easily find it closed as open. We would assume that Harlem Children's Zone is not there to staff open hours on weekdays when school is not in session, thus on the Jewish holidays, at Thanksgiving, or during the Christmas, February, and Spring vacation weeks, the yard is probably not open. Based on our visits weekdays in September and October, 2009, the custodians lock the yard up after school more often than not. In all, we estimate that the yard can have 100 or more community users on a nice summer day, or on a day when Harlem Children's Zone sponsors activity at the yard (4 or 5 times a year). On average, we lower the estimate to 40 per day to account for days when the yard is closed or, for whatever reason, not as many people come.

P. S. 93, when measured in spring 2008, had seen a robust growth in community use over pre-construction conditions (Table 3).

TABLE 3  
P. S. 93 ESTIMATED ANNUAL COMMUNITY USE POST-CONSTRUCTION

	Fair days	Users per day	Sub-total	Rainy/ cloudy/ cool days	Users per day	Sub-total	Cold days	Users per day	Sub-total	Total 2008
Weekends	40	80	3,200	17	35	595	44	20	880	4,675
Weekdays while school is in session	63	45	2,835	30	20	600	95	15	1,425	4,860
Summer weekdays, holidays, sch vaca	45	70	3,150	15	30	450	16	15	240	3,840
Total	148		9,185	62		1,645	155		2,545	13,375

Table 4 gives post-construction estimated population at I. S. 73.

<sup>1</sup> This worker said she should receive a written request for information before giving out any information, even though she had already given some information orally. She asked for a written request, saying she would then reply more fully in writing. ActKnowledge sent the request later that day but never heard back from her.



TABLE 4  
I.S. 73 ESTIMATED ANNUAL COMMUNITY USE POST-CONSTRUCTION

	Fair days	Users per day	Sub-total	Rainy/ cloudy/or cool days	Users per day	Sub-total	Cold days	Users per day	Sub-total	Total 2009
Weekends	40	90	3,600	17	50	850	44	8	352	4,802
Weekdays while school is in session	63	25	1,575	30	10	300	95	3	339	2,214
Summer weekdays, holidays, sch vaca	45	60	2,700	15	40	600	16	6	96	3,396
Total	148		7,875	62		1,750	157		691	10,412

Table 5 gives a comparative summary of estimated user visits to the three schoolyards before and after construction. Among community users, the greatest proportional increase is at P.S. 242, where community access went from negligible to an estimated 5,000. With better access in the future the usership could be much higher. P.S. 93 has the largest absolute numbers before and after construction and the smallest proportional increase, from 7,800 to 13,400 user visits. At I. S. 73, the numbers in our estimates have more than tripled, from only 3,000 to 10,400 user visits per year.

TABLE 5  
COMPARATIVE POPULATION ESTIMATE PRE- AND POST-CONSTRUCTION

	PS 242 Large Yard		PS 93		IS 73	
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School day and after school	50,000	53,500	24,900	57,600	37,000	83,800
Community	-	5,000	7,800	13,400	3,000	10,400

Table 5 reports much higher numbers for school-day and after-school users at all three sites than for community users. The annualized numbers seem high, but again, we are counting the same heads. Many community users are repeat visitors as well, but many others are first time or one-time visitors. For all user categories, the estimated totals are based on heads counted (or estimated) and not on which heads. This follows standard practice in counting users of public spaces, where frequency of visits does not figure into the calculation.

## DISCUSSION

### Gender and Forms of Play

Table 6 summarizes the data from structured observations on two variables: gender and structured versus unstructured play.

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OBSERVED DATA BY SEX AND FORM OF PLAY

		Female	Male	Total	Percent female		Struct- ured	Unstruct- ured	Total	Percent unstructured	
IS 73	2007	22	225	247	0.09	9%	187	60	247	0.24	24%
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	2008	428	317	745	0.5745	57%	336	409	745	0.55	55%

A caveat: the values in this table are just raw numbers. Comparisons across sites and from pre- to post-construction conditions cannot be readily made from these numbers because they have not been adjusted for disparities in things like numbers of observations—i.e., the more often you count the more people you are likely to find. However, comparing proportions within one data set to the same within another data set can be meaningful. At I. S. 73, for example, 22 girls in 2007 versus 501 in 2009 means nothing because we were able to conduct many more observations in 2009. However, comparing the girl/boy proportions in 2007 to the same in 2009 does tell us something—that in 2007 one was more likely to find a boys only recess than a girls only recess, and that weekend use was dominated by boys playing basketball. In 2009 these gender differences persist but the new yard has moderated their effect.

At all three sites, the proportion of girls among persons observed increased more rapidly from pre- to post-construction.

- At I.S. 73, where girls were less than 10 percent of observed users before construction, they were 34 percent in 2009, a year after the playground reopened.
- At P.S. 93, girls increased from 37 percent to 43 percent of the total.
- At P.S. 242, girls, already at 42 percent, increased to 57 percent—i.e., girls became a majority of the persons observed.

We cannot say why visits by girls have risen faster than visits by boys. It may be related to the increase shown in the same table among unstructured uses. Structured activity is typically athletic and predominantly male. Unstructured activity, including talking, hanging out, running, and jungle gym play, is at least as attractive to girls as boys. To the extent that the playground program has produced spaces more conducive to unstructured activity, the spaces may also be more attractive to girls. Sometimes too adults prioritize boys in access to structured forms of



play like organized sports, or in access to outdoor versus indoor play. Of the three sites in this study, we noticed overt discrimination in favor of boys only at I.S. 73, where school recess is often segregated. Presumably female recesses occur as frequently as male recesses but our observations suggested that boys were preferred for outdoor recess. Also at 73, the sports oriented after-school program has a noticeable preference for boys, at least among the activities that occur outdoors in the schoolyard.

Unstructured uses increased phenomenally from pre- to post-construction. Unstructured uses went from 24 to 52 percent of all observed uses at I.S. 73; from 30 to 64 percent at P.S. 93; and from 41 percent to 55 percent at P. S. 242 (large yard). This finding seems ironic in light of school and after-school officials' preference for organized, adult-recognized forms of play. Officials all found spontaneous play wanting and agreed that the rebuilt schoolyards would enhance and increase their ability to offer organized games. While the new schoolyards have met that hope, as organized games can now be played in greater number and variety, much more of the overall increase in schoolyard use can be attributed to the unstructured activities. As noted in the individual site reports, the combination of seating, soft surfaces, and synergies resulting from the spatial arrangement of circulation routes and different active and passive activity zones has made the yards at all three sites much more attractive to socializing, talking, hanging out, jungle gym play, sitting and lying on the grass, and other "unstructured" forms of play.

## Community Use

The most salient variable in community use of the rebuilt schoolyards is reliable access. At P.S. 93, access has not been an issue. The several gates to the large schoolyard appear to be open all the time, even during the school day, which was true prior to construction too.<sup>2</sup> I.S. 73 keeps the two gates to its schoolyard locked during the school day. The gates are sometimes open or at least unlocked during after-school but if people not in the after-school program enter the yard then they may be asked to leave. Evenings and weekends the gates are open. At P.S. 242, the large yard has one gate, which, during our visits in spring and fall 2009, was usually locked. The gate is often open weekends but only at certain hours, which, one resident remarked, are not posted, and which change depending on the season.

The amount and patterns of use among all three user constituencies--the school-day, after-school, and community users--involve a number of variables that will ground the following discussion. These are:

- "Push and pull"
- Community partners
- Neighborhood social context
- Layout and spatial context

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<sup>2</sup> P.S. 93 has a fence with gate that separates the major part of the schoolyard from the school buildings and the courtyard area. That gate is locked during the school day and opened up for recess, outdoor classes, after-school activity, and other school-day uses of the larger yard.

## Push and Pull

As in economics, public space “consumption” involves a dynamic interaction between the “pull” of supply and the “push” of demand. On the supply side we have the “If you build it they will come” ideal of a beautiful new facility that attracts droves of happy users. We found that ideal most closely fulfilled at P.S. 93, where 100 or more people at a time were using the schoolyard on nice early summer evenings. The yard at I. S. 73 also attracts users, although from what we can tell mostly middle and high school-age youth coming on their own rather than whole families with young and/or older children.

There surely is a demand for outdoor space, especially among children and youth, to play and socialize together—to “hang out”, so to speak. If left to their own without any attempt to steer them toward one sort of space over another, many young people will choose the most convenient spaces, which, in big cities, often do not meet adult criteria for safe, wholesome play. The playground movement that began over 100 years ago in New York and Boston sought to provide children with wholesome recreation activity in safe spaces set aside from the street and sidewalk. Those early playgrounds incentivized demand, in part by being safe, attractive, and well equipped; and in part by providing supervised, structured forms of play. The Playgrounds Program is trying to do something similar, relying, however, mostly on the attractive power of the amenity itself rather than on the staffed supervision in the original, Progressive Era formula.

Among our three schoolyards, a semblance of the staffed version has been offered at P.S. 242/FLI, partly because the principal of one of the partner schools there would not allow community access without it. At times, particularly during planned events, the Harlem Children’s Zone monitors have drawn substantial numbers of community users. Most of the time, the monitors are not active supervisors or play leaders, and they often seem to stay inside the building, but their presence can make a positive difference in attracting young people who might, otherwise, not feel safe. The other sites, which have no staffing, are both drawing more community users than 242, largely because of the access problem at 242.

Issues that mediate the push of demand include inconsistent open hours and fears for safety. P. S. 242/FLI has been very inconsistent. When the yard opened in fall 2007, it remained locked to the community for months. When ActKnowledge returned to observe activity in spring 2008 we found no community activity to observe because the yard was locked up. By summer and fall 2008, with monitors from Harlem Children’s Zone onsite, we understand there was a significant amount of community use evenings and especially weekends. In the winter months of 2008-09 the monitoring fell off and the yard was locked much of the time. In spring 2009, after pressure from residents of West 121<sup>st</sup> street, school officials and Harlem Children’s Zone once again worked out a solution for opening the yard, at least in plan. Young people we spoke to along West 121<sup>st</sup> Street in fall 2009 said yes, there was a lot of use in the summertime, with people there until nine at night—families, girls braiding one another’s hair, kids on the jungle gym, etc.—but in fact, it’s not open a lot of the time. One objected “It’s supposed to be for the community.”

An adult resident of the block described a long and frustrating experience trying to cajole school and Harlem Children’s Zone officials into keeping the yard open at regular hours. As she described it, after a lot of effort, things would be in good shape—regular hours, nice family

activity, participation by residents of the block, and so on. Then came winter, interrupting these routines, and in the spring it would take another big effort to push people to open the yard. Then comes summer, routines change, once again the yard is closed to the public, and then another campaign is necessary. Once such an activist resident has had enough of trying to move the needle by herself, either someone else takes up the cause or, as she put it, the bureaucratic inertia prevails.

While we assume that a locked gate is sufficient to thwart demand, the “push” to use the space is strong enough in a handful of youthful users on West 121<sup>st</sup> Street that they do not allow the locking of the yard to get in their way. An ActKnowledge observer saw, on two different occasions, middle- and high-school age boys entering and exiting the schoolyard, with balls and scooters, through a tear in the fence fabric next to the derelict property at the eastern end of the yard. On one of these occasions, some of the boys got in by climbing up over the gate, which is at the opposite, western end of the yard. Over the course of an hour these boys went in and out of the yard with almost as much ease as if the gate were open. Perhaps for most children and youth, the real demand is for convenient but not isolated outdoor space, if not for playgrounds in particular. Hence the need to entice young people off the streets and into playgrounds. For this minority, the playground is worth the trouble of getting past a locked gate.

For the most part, if the schoolyard is locked, people are not going to use it. If the yard is supposed to be open but in fact is locked, then some people seeking to use may give up and go elsewhere. If the yard is locked up in broad daylight because the monitoring agreement only provides for monitors until four o’clock, some people, on the next occasion, will choose to go somewhere else. These obstacles to schoolyard use are perhaps too obvious to point out, yet the problem of securing dependable access within the bureaucratic structure of the New York City schools is critical to the success of a program that purports to make schoolyards into community parks. At least one characteristic of bureaucracy is the lack of any commitment to a larger vision, whether it be community access in particular or social justice in general. We see this throughout our evaluation work in the New York City schools: the system elicits self-protective behavior and values that prioritize order and dependability. Any effort to do something of real value for the community beyond one’s job description brings added responsibility and will not be rewarded by the system. Based on the experience at P.S. 242, TPL’s playgrounds program and the larger schoolyards-to-playgrounds program it spawned need a strategy in place to offset the opacity and inertia of the school bureaucracy. A piece of the strategy may be finding the right community partner, one with the resources to persevere and with a mission that embraces the Playgrounds Program objectives.

Fears for safety also undermine demand. Our observations and interviews revealed a few instances that point to more general safety concerns. One involves the divide between older and younger children. In these neighborhoods, children as young as 10 may be out on their own or with an older sibling. The younger ones among them like to play ball, ride bikes and scooters, play on the jungle gyms, and other exertive activities. Older youth do all these things but also like to hang out. Whether the hanging out or the demeanor or the sometimes rough play, these older youth sometimes intimidate younger ones and their parents. The P. S. 242 principal said as much when asked about families coming to the schoolyard, adding that the

parents accompanying younger children are put off by the presence of older kids playing and hanging out. Principal Gomez thought that the placement of the gate, next to the basketball area, means that families coming with children who want to use the jungle gym must first get by the older youth hanging out and playing basketball.

In Maspeth our field worker described a weekend scene where two sets of parents and children became noticeably tense when a group of teenagers entered the yard. The teens, who were carrying beverages of some sort and may have been smoking marijuana, headed for the recessed area between the school buildings that's semi-private and out of sight of the street. This is, in fact, just the sort of place that teenagers like to hang out—it has “found” seating in the form of steps into the school, a sense of closure and privacy but at the same time they can see who's doing what on the turf and track, and even be seen by people in the schoolyard who care to look.

There are also safety issues at the Harlem site that involve divisions of class and race—in one case a white boy fond of playing basketball with others in the neighborhood who was frightened by an older black boy. The white boy's mother felt that a public space like this is one of the few places where people from different sides of the class and race divide in gentrifying Harlem can come together. Her son playing there was part of a set of activities that, as she saw it, led black kids in the neighborhood to see her son and his family not as just “those rich people” but as friends. Now her son is afraid to enter the schoolyard and his connections to the other children are not being renewed. Incidents like this would seem to support the argument for having adult supervision on the yard.

### Layout and Spatial Context

The demand for these schoolyard playgrounds is affected by what other spaces are available. At the Maspeth site, one resident said that families generally use Frontera Park, a Parks Department playground located half a mile away from I.S. 73 across the Long Island Expressway cut. This is probably too far for most young people in the immediate area to travel on their own, but families out together in leisure hours may choose the park over the I. S. 73 schoolyard as the park offers more of everything plus drinking water and restrooms. On another occasion, a family using the I. S. 73 schoolyard for the first time said they usually go to Juniper Valley Park, not so far away in Middle Village, but they would like to come here again. The P.S. 93 schoolyard in Soundview has less competition from other spaces. Although the boundary of Soundview Park is a block away, the park entrance is several blocks to the east. Many of the users at P. S. 93 appear to come over the footbridge from the high-density tenement blocks between Westchester Avenue and Bruckner Boulevard, for whom P.S. 93 is the closest open space. In Harlem, P.S. 242 offers a resource for the immediate area, and will even attract families from the immediate area despite nearby Mount Morris Park. A boy there said people on this side of Lenox Avenue like to come here—if it's open.

In Soundview, the proximity and visibility of the footbridge over Bruckner Expressway made a huge difference in attracting people from the other side of the expressway. In Maspeth, we observed a fluid overlapping of territories between the yard and the sidewalk. Sometimes people gather on the sidewalk towards five o'clock, waiting to get into the yard. These are

youth from the neighborhood, who may also be I. S. 73 students but are not in the after-school program, and who hang out on the sidewalk, looking in, talking with one another, sometimes talking with kids they know who *are* in the after-school program. Sometimes when the gate is open, they go in themselves. Later, when after-school wraps up, youth come and go between the sidewalk and the yard interior. The placement of the southerly gate next to the seating and the basketball area may contribute to this rapport across the fence; it is as if the sidewalk is an extension of the yard. More important, a short walk down 71<sup>st</sup> Street from the yard leads to the shops and restaurants along Grand Avenue, and we saw lots of coming and going from yard to sidewalk to Grand Avenue and back the other way.

At P. S. 242, the fence seems more barrier than connective screen. The fence there includes a low and fairly comfortable wall that people sit along, yet in our observations the sitters are adults, sometimes high on some substance, who have no intention of entering the yard. While we don't think much of Principal Gomez's idea that the gate's proximity to the basketball court deters the parents of young children from entering the schoolyard, it is possible that having another gate close to the Lenox Avenue end of the yard would create a stronger connection between the yard and the flow of foot traffic along 121<sup>st</sup> Street and Lenox Avenue.

### Community Partner

From our research at the Harlem and Maspeth sites, mostly, we raise the question of what makes the ideal community partner. At Maspeth, the partner who signed up with TPL is an after-school provider, Maspeth Town Hall. At Harlem, the partners are FLI and Harlem Children's Zone. It is in the interest of these parties to be active promoters of school-day and after-school activity in their yards, which they are. Ordinarily, a school would not be especially effective in fostering or advocating for evening and weekend use—that is, for general community use. A CBO like Maspeth Town Hall should be the right partner, but MTH seems to limit its role at 73 to that of after-school program provider. A 121<sup>st</sup> Street resident we talked with thought Harlem Children's Zone would have been a better community partner for the P. S. 242 schoolyard because sponsoring community activity belongs within their mission and they run weekend activities at the P. S. 242 site, just not in the schoolyard. Ideally a community partner would already have community programs and activities which it could relocate to the schoolyard. Having activity attracts more activity; it can also create a sense of safety. As someone pointed out, a group of 25 kids doing something every Saturday at a site will each know 25 or more other people who might be attracted to the yard to be with their friends or siblings. Harlem Children's Zone has done some good things at P.S. 242 but not consistently. If they had more funding available they might be more consistent in anchoring and promoting community use of the yard.

### Social Context

The social context can complicate the effort to create a vibrant community park. Any neighborhood has complexities that do not appear immediately. For example, we were surprised in 2007 to find sharp differences in Soundview over who had rights of access to the P. S. 93 schoolyard. Territorial disputes like this probably continue, although we expect that the

new facilities, in attracting a wider cross section of people and uses than before, may make it more difficult for a single group, like the Ecuadorian volleyball players, to take over the space, and thus leave more room for everyone to have a stake in how a space is used. Still, Soundview and Maspeth seem to be relatively homogeneous in comparison to Harlem, where blocks like West 121<sup>st</sup> Street have affluent white and African American professionals (including the 2009 Democratic Mayoral candidate) living in restored brownstones next door to working class and poor people of color. This condition adds class and race barriers to the usual insider-outsider territorial dynamic. Principal Gomez responded by circling the wagons to keep a difficult and fractious community out. Another response would be to take the opportunity the new space presents to create a community space that cuts across the divisions.

This discussion leads us back to the “push and pull” idea, in that the enticement necessary to ensure satisfactory community use, at least in some settings, may have to depend on active promotion in addition to the foundational enticement of a beautiful and accessible space. Harlem Children’s Zone workers on site, for example, say that ordinarily the turnout is thin—10 or 12 people at a time—but when they have put on events or accommodated block association events, the yard has been very active. Communities like Harlem pose a greater challenge to the effort of creating a vibrant community space, especially on Department of Education property, but success may bring a richer payoff.

## CONCLUSION

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**More Use.** The new facilities and amenities attract users in all target groups: staff and students, after-school program staff and participants, and community residents.

- Clear advantage to the school population with regard to:
  - Routine activity at recess, outdoor classes, after school
  - Special events held in the yards at P. S. 93 and 242.

**Schoolyards can become neighborhood/community spaces.**

- Broad use, as found at P. S. 93 post-construction, ameliorates the tendency for one group or another to take over and dominate, making the space attractive to the people it is intended to serve.
- In relatively safe neighborhoods, at least, the pull of the new yards and the push of demand for public outdoor space yields big increases in the amount and variety of use. In some locations, e.g., P. S. 242, staffing and programming may need to be part of the mix.

**Access** is essential to community use and cannot be taken for granted. Securing access may require an up front strategy to deal with changes in personnel, community opposition, etc.

**Community Opposition** is a factor: not everyone shares the vision of a vibrant community space.

- Opposition from residents of W. 122<sup>nd</sup> Street led Principal Brewster to remove basketball hoops and lock the schoolyard at P. S. 242.
- Similar opposition led to Boynton Ave residents taking it upon themselves to lock up the yard at P. S. 93.
- No opposition at 73 except to people bringing dogs into the new yard.

New facilities seem to change the dynamic, as the incidents cited above occurred prior to construction, but we cannot say for sure just how. The new yards attract socially positive users and behavior which tends to please residents.

**Casual, unstructured forms of play** and leisure have increased more than the conventional organized games school officials hoped for, although the latter have increased too.

- Do not underestimate the value of unstructured recreation.
  - Valuable in itself
  - Very supportive of/complementary to the organized sports.

**More girls** are in evidence at all times. We think this is related to the disproportionate growth of unstructured forms of leisure and recreation.



## APPENDIX A. USERSHIP ESTIMATION METHODOLOGY

TPL wanted to get a rough idea of how many people use the schoolyards, particularly between the two points of comparison: before construction and after. In estimating numbers of users over a season or a year, we had two data sources: 1) direct observations, and 2) the school population. Both were essential in estimating user numbers, yet each had limitations. We could not do enough observations to have reliable actual numbers in all the characteristic periods—i.e., summer weekend days, summer evenings, spring schooldays and evenings, fall weekend days, and so on—from which we could then extrapolate to the whole season and year. Therefore much is left to assumption and projection.

Population data was helpful only with institutional users, namely the school-day and after-school population, for which we have knowledge of the school enrollment, recess periods, after-school program enrollment, outdoor classes, and so on. Community population data would not be useful in estimating community use of the schoolyards since no one is required to use these public spaces and nothing in the population data tells us how many will visit them.

### Structured Observations

The research involved structured observations of the three schoolyards at optimal times of the year. At each site we observed activity prior to construction, then returned to make more observations after construction. At public schools 242 and 93, the work was done in May and June. At intermediate school 73 the work was done in September and October, and, in the final year, in May and June. We began work at 242 and 93 in spring because those sites were about to go into construction and we needed preconstruction data. We were referred to the third school, I.S. 73, that fall (September 2007) and began work then.

Given the limited budget for observations, we used a “judgment sampling” method, that is, exercising our judgment as to which elements of the universe to include in the sample. We made observations during school-day and after-school hours, and on weekends and evenings, on days that seemed likely to be most representative. We designed a data collection instrument to give structure to the observations; the instrument had activity classifications and codes and a map of the yard. The field observer counted people by activity, sex, and age group during a 30-minute observation period. School day observation periods were timed to coincide with recess periods and after-school outdoor activity periods. The observer also located the activity on the field map for use in comparing pre-construction and post-construction activity.

Structured observations were carried out at times we thought to be characteristic of predominant use patterns: school day, after-school, evening, weekend. Observations taken at those times would be bases for extrapolating user numbers over all the periods we could not sample.



## Interviews and Participant Observation

The research methods included key-informant interviews and informal observations based on the anthropological method of “participant observation”.

- Key-informant interviews are conducted with so-called key informants—that is, persons with particular knowledge of the sites. These included principals, assistant principals, custodians, and after-school program personnel.
- Participant observation included making impromptu contact with people on the site and taking fieldnotes on the researcher’s observations and perceptions. We struck up conversations with people on the scene including playground users, maintenance personnel, teachers, school aides, passers by, and neighbors.

These interviews and conversations provided us with all the population parameters we needed to estimate school-based playground use, including enrollment, the timing and number of recess periods, outdoor classes, public access to the schoolyard, and so on. The interviews and participant observation gave us considerable knowledge of the social and cultural context in which these playgrounds exist.

## Classifying Activity: Structured and Unstructured

We sorted observed activity as either structured or unstructured, reflecting the concerns of school and after-school officials at all three sites (whom we consulted through key-informant interviews) who shared a preference for more organized or structured forms of play. In their view, the smooth-surfaced, undifferentiated quantity of space that existed prior to reconstruction accommodated too much unstructured play. They saw the structured courts and fields in the design of the new yards as much more supportive of organized or “structured” play. In our method, structured activity can mean games with established forms of play, rules, competing teams, coaching, and a particular ground or facility where the game is played. Structured activity can even mean informal, child-initiated games like kickball or jump rope—recognizable games that have some structure to them. School officials thought such structured activity allowed children to let off steam in ways that supported the educational mission of the school. They learn about team play, sportsmanship, excelling as athletes, and so on. Unstructured activity, including spontaneous running and games of tag, was described as less desirable. One assistant principal called recess play “haphazard...I’d like to see it more organized.” We coded all such running/tag, also hanging out, sitting or standing, and talking together as “unstructured”. In post-construction fieldwork, unstructured play included all play on the jungle gym and other fixed play facilities.

## Estimating School-Day and After-School Use

For school-based user population--the institutional users--we compared the observed frequencies with the numbers derived from population parameters including school enrollment, recess periods, known outdoor classes, and others. For example, if the enrollment is 1,700 and the school has five lunch/recess periods, one might expect to find roughly one-fifth

of the student body in the schoolyard during any one recess period, less 15% or so assuming absences, field trips, and so on. However, the number of users one would expect to find in this way were typically much higher than the numbers actually observed on the playground. For example, at I.S. 73 it was the custom to separate boys and girls in outdoor recess; thus one or the other (more often the girls) would not be in evidence in the schoolyard during recess. Sex-segregated recess drops the number of users at any one time by half. Sometimes school aides or teachers at I.S. 73 would “punish” students for lunchroom misbehavior by not letting them out for recess. For these and other reasons we sometimes found no one on the playground during recess.

Given the two bases of estimation—observed frequencies and data derived from population parameters—we determined “point estimates,” that is, numbers interpolated between two data points that could be the bases of extrapolating attendance over time. For example, if population parameters lead to an estimate of 400 users between 9:00 a.m. and 1:00 p.m., but we observed only 150 users, a conservative point estimate of 200, lying in between the two data points but closer to the one based on frequencies, provides a basis for making seasonal use projections. With these point estimates we made simple linear extrapolations over all the characteristic periods of the season and year. To these projected numbers we would add estimates for special events held on the playground, such as an annual cultural festival or activity day.

### **Estimating Community Use**

A good estimate of community use is more elusive than that of school-based use: since neighborhood census data would not be predictive of playground use, we had only our observational data to go on. The budget did not allow for random samples throughout the year, thus we have sample frequencies in only one season at each site. Structured observations, using the same instrument as described above for the school day, were carried out on a judgment sample basis, choosing evenings and weekend afternoons likely to be representative. These observations were conducted at the same time of year as the school-day observations at each site. Observations taken at those times would provide bases for determining point estimates and making extrapolations over all the periods we could not sample.

Characteristic periods which we sampled included evenings and weekend afternoons. The observed frequencies were erratic.

**Evenings:** Summer evenings could have very high use if the conditions were right and the playground open. Mostly, our data from counts taken on evenings during the opening or closing months of the school year were low. Some yards are locked at dusk, which, depending on the time of year, leaves little time between end of the school day or after-school programs, at 5:00 or 6:00 o’clock, and lockup. Only at P.S. 93, which generally did not lock its yard, did we find evidence of high evening numbers, even before construction, and especially after construction in long early summer evenings.

**Weekends:** We observed in midday-to-afternoon periods when we thought it most likely to find a diversity of users and activities.

## Developing an Annual Estimate

Once we had population point estimates for each of the observation periods, we were ready to make extrapolations over all periods to arrive at an annual estimate. In making extrapolations, we adjusted for season, weather, and temperature.

For the purpose of estimating annual usage, we used three season types: summer, shoulder season (spring and fall), which were the times of our observations; and winter. Warmth and sunlight make summer a season of potentially high community use. Shoulder season use is limited by cold, especially in spring, and by darkness in the fall. Winter brings minimal use among the school-based population and we assume little community use. With point estimates determined for the shoulder season, we adjusted the period estimates upward for summertime community use and downward for wintertime use.

We accessed weather data for recent seasons from the National Weather Service to estimate the influence of weather on playground use. Looking at rainfall, temperature, and cloud cover as variables, we made assumptions about how many days in each season the school would likely have recess and other activities outdoors in the yard. The weather data show mean high and low temperatures, the number of days with some rain or a lot of rain and the number of days sunny, partly cloudy, and cloudy. While there is some covariance among these variables, sunny days can be cool and windy, warm days may be cloudy, otherwise fair days may have rainfall early or late, and so on. We cannot be sure how the variables converge on any given day to influence playground use. Thus we make assumptions and hope they are fairly accurate. The attached worksheets give weather and climate data and show our calculations and assumptions.

A word about repeat users: Many of the visits to the schoolyards are made by the same people day after day, the members of the school population. Community users are also repeat users in many cases. The usership estimates given in the report do not take repeat users into account. The figures are estimated visits over the year, no matter how many are the same visitors. Among the community population we have no way of distinguishing among users according to frequency of use. School-based users are nearly all repeat users but for the purpose of estimating annual usership it is expedient to think of annual *visits* rather than annual *visitors*.