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Research Paper

If we transform the landfill, will they come? Predicting visitation to Freshkills Park in New York City

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ABSTRACT

Efforts are underway to transform the former Fresh Kills Landfill in Staten Island (SI), NY into Freshkills Park (FKP). Data from a mail survey of 1006 SI residents were used to examine the impact of factors that might facilitate or inhibit intentions to visit FKP once it opens to the public. Facilitators significantly impacting intentions included proximity, past visitation to other SI parks, and familiarity with the FKP site when it was an active landfill. Variables representing likely use of recreational facilities or programs and the presence of children in the household were not significant. Inhibitors significantly impacting intentions included lack of trust in the government agencies managing the development of FKP and health risk concerns. The pattern of results, along with responses to open-end survey questions, suggests that SI residents are curious and are likely to visit FKP at least once. The challenge for park planners and administrators will be to garner this initial curiosity and cultivate repeat visitation and long-term loyalty.

1. Introduction

In 1948 the City of New York established the Fresh Kills (FK) municipal landfill on a 3000-acre salt-marsh on Staten Island (SI) to address the increasing solid waste disposal needs of New York City (NYC) (Fig. 1). Although it was not initially intended to be a long-term solid waste solution for NYC, the site received garbage for 53 years and became the largest landfill in the world. At the height of its operations in the mid-1980s, it was receiving 26,300 metric tons of garbage per day (NYC Department of Parks and Recreation, 2016). Responding to increasing public pressure over environmental, health, and aesthetic concerns, FK stopped receiving garbage in 2001. By this point, the landfill contained approximately 136 million metric tons of solid waste and spanned 931 ha (NYC Parks, 2016). Recognizing the potential that redeveloping the FK site could have on the landscape and the community, and building on the legacy of Ian McHarg and his seminal study of SI (McHarg, 1969), an international design competition and community outreach process was launched in 2001 to transform FK the landfill into Freshkills Park (FKP). The award winning *Master Plan for Freshkills Park* was developed by James Corner Field Operations in 2001; in 2006 the NYC Department of Parks and Recreation (NYC Parks) assumed responsibility for implementing the project using that plan as a conceptual guide (the original and updated plans for FKP are available at Freshkills Park Alliance, 2013).

Whereas FK was notable for many reasons, FKP will be equally notable for a host of other reasons. Specifically, FKP will be the largest park to be developed in NYC in over 100 years and the largest landfill-to-park transformation project to date in the world. Once its complete (in 2036) FKP will be two and a half times the size of NYC's Central Park and offer a wide array of recreational, cultural, and ecological amenities and programming, as well as be a showcase for the city's sustainability initiatives (Freshkills Park Alliance, 2013; NYC Parks, 2016).

The first phase of the FKP development is now complete, and includes a soccer field complex (Owl Hollow Fields) at the southern edge of the site, a playground area (Schmul Park) at the northern edge, and a 5.1 kilometer trail (the New Springville Greenway) along the eastern edge. NYC Parks, which will manage FKP, is interested in gauging attitudes towards the site and interest in visitation now that the park is opening to the public. While extensive scoping and outreach were done in the planning phases and development of the master plan for FKP, little research has been conducted to evaluate attitudes towards FKP and intentions to visit since the redevelopment phase began.

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Fig. 1. Location of Freshkills Park (formerly Fresh Kills Landfill) relative to Central Park in New York City.
Source: NYC Parks.

1.1. Background

While the FKP project is significant for its size and historical context, it is not the first municipal landfill to be converted into a park or green space. Harnik, Taylor, and Welle (2006) estimate that at least 250 parks, green spaces, and recreational sites have been built on top of former landfills. Notable examples include Ariel Sharon Park in Tel Aviv, Israel, Flushing Meadows-Corona Park in NYC, Millennium Park in Boston, and World Cup Park in Seoul, South Korea. Former landfills and other urban industrial sites are often referred to as brownfields–a term defined by the U.S. Environmental Protection Agency as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant " (U.S. Environmental Protection Agency, 2016). Interest in how to redevelop brownfield sites has been growing in the U.S. since the 1970's as a way to support local/urban revitalization. Closed municipal landfills are often attractive options for creating urban parks due to their size, location, and subsidized acquisition and/or remediation costs; important characteristics in the face of limited land availability and escalating land costs (Harnik et al., 2006).

The benefits of brownfield redevelopment include: job creation (Howland, 2007), increased property values (De Sousa, Wu & Westphal, 2009; Simons & Saginor, 2006) and property taxes (De Sousa, 2005), reduced health risks (Wedding & Crawford-Brown, 2007), redressment of environmental in-justices (Wolch, Byrne, & Newell, 2014), habitat restoration (De Sousa, 2003), improved neighborhood livability

(Wedding & Crawford-Brown, 2007), and enhanced/expanded recreation space (De Sousa 2004, 2006; Siikamäki & Wernstedt, 2008). Despite these benefits, few studies have examined attitudes, perceptions, and visitation behavior at parks that have been developed on restored brownfields and other post-industrial sites (De Sousa, 2006; Mowen & Confer, 2003; Zhang & Klenosky, 2016).

In one of the few studies on this topic, Mowen and Confer (2003) examined visitor perceptions and intentions to re-visit a park built on the site of a former brownfield in Ohio. Drawing on Rogers (2005) model of the diffusion of innovations in a social system, they found that perceived accessibility, convenience, compatibility of the site with neighboring communities, and perceived advantages over existing neighborhood parks were significant predictors of future visitation intentions. In another study, De Sousa (2006) surveyed visitors to three Midwest US parks developed at former brownfield sites. The results showed that park projects contributed to quality of life at both the individual and community level, most notably by enhancing scenic beauty and neighborhood appeal; improving access to trails, recreation space, and nature; boosting community pride; removing blight; and improving physical fitness. While these investigations are important, both studies involved brownfield-to-park projects that were relatively small in size (the largest being 115 ha) and collected data from current park visitors only.

The present investigation differs in two important ways. First, it involves a park-transformation project that is much larger in scope. Second, it involved collecting data from members of the broader community (i.e., residents of SI) rather than current park visitors. These difference allows us to identify and better understand those that may visit and, equally important, those that may not. In this paper, our objective is to evaluate factors that may influence the likelihood that SI residents will visit FKP once it is developed. This analysis contributes to existing research on landscape change and sustainability initiatives focused on restoring brownfield and landfill sites for green space and recreation use (Cranz & Boland, 2004; De Sousa, 2014; Zhang & Klenosky, 2016), as well as informs efforts to develop marketing, outreach, and communication programs for FKP. This research also serves as a baseline for documenting whether or how beliefs, attitudes, and behaviors change over the course of the evolution of the FKP site.

1.2. Conceptual framework

A number of conceptual frameworks were considered to guide this investigation. One framework, employed in a recent analysis of the present dataset (Vogt, Klenosky, Snyder, & Campbell, 2015), draws on a new product development/marketing approach (Assael, 2004; Day, 1992; Rogers, 2005). This conceptualization focuses attention on the stages of the new product (i.e., new park) adoption process (awareness, interest, desire, and action) and the characteristics of early product adopters (initial park visitors). The analysis presented in Vogt et al. (2015) examined perceptions of SI and FKP for user segments based on proximity to FKP and experience history with the site (ranging from those that were recent residents of SI to those that lived on SI prior to the site becoming an active landfill). Consistent with expectations, residents most proximal to the site had the strongest attitudes and intentions to visit the site. Interestingly, however, while recent residents were less familiar with SI and with the plans for FKP (compared to longtime residents), they were equally likely to hold positive attitudes toward FKP and have positive intentions to visit once it is built. The present paper seeks to build on this analysis by exploring a broader set of factors that might impact visitation intentions.

Another framework we considered is the conceptual model developed by Bedimo-Rung and colleagues to understand the role of parks in promoting physical activity (Bedimo-Rung, Mowen, & Cohen, 2005). According to the model, park visitation is viewed as a function of two correlates: individual and park environment characteristics. Individual characteristics include age, gender, race/ethnicity, socioeconomic status, and residential location. While park environment characteristics include park features (i.e., recreation facilities, programs, and amenities), condition (facility maintenance/safety; and incivilities including litter, vandalism, and loitering), access (proximity/availability), aesthetics (perceived attractiveness/design considerations), safety (crime/security concerns), and park policies (park management/budget priorities). The framework has been successfully employed in a variety of park settings (e.g., Cohen et al., 2016).

A third model is the facilitators-inhibitors framework which has been used to study visitation behavior in recreation and tourism settings (Kim, Heo, Chun, & Lee, 2011; Raymore 2002; Um & Crompton, 1992). According to this perspective, visitation is viewed as a function of two factors–facilitators (e.g., beliefs about site attributes that help to satisfy the motives of potential visitors and thus promote or encourage visitation) and inhibitors (e.g., beliefs about a site that are incongruent and thus inhibit or prohibit visitation) (Raymore 2002). The facilitators examined using this framework (Kim et al., 2011; Um & Crompton 1992) have included need satisfaction or intrapersonal factors (novelty, challenge, enjoyment, past experience, and relaxation), social or interpersonal factors (inclinations to act in accordance with social group or authority opinions), and ability or structural factors (possessing available resources and qualities needed to travel to or visit a site including financial resources, health/wellness, accessibility, free time, and transportation). The inhibitors examined to date have tended to center on factors that constrain leisure behavior (cf., Crawford, Jackson & Godbey, 1991) such as time, money, access, family constraints, and site-related factors such as safety/security and health concerns. Empirical applications of the facilitator-inhibitor model have tended to focus on travel to out-of-state and foreign destinations (Botha, Crompton, & Kim, 1999; Um & Crompton, 1992), as well as visitation to museums (Tian, Crompton, & Witt, 1996). However, it has yet to be used to study visitation in park settings.

While there is some overlap across models, the present study draws primarily on the facilitator-inhibitor framework to model the likelihood that SI residents will visit FKP. In particular, the framework will serve as a starting point to better understand the factors that may attract or deter visitation.

1.2.1. Potential facilitators and inhibitors to visitation at FKP

Selection of potential explanatory variables was guided by a review of the literature on brownfield redevelopment, green space use, and park visitation behavior using the lens of the facilitator-inhibitor framework. The variables examined included five facilitators: proximity to the site, presence of children in the household, experience visiting other SI parks, experience/familiarity with the FKP site and other similar landfill-to-park settings, likelihood of using the recreation areas/facilities and programs planned for the site; and two inhibitors: perceived health risks from visiting the site and trust with the government agencies involved with the site's development.

1.2.1.1. Proximity. Previous research has shown that closer proximity to parks has an association with visitation. Dwyer and Klenosky (2004) found that increasing distance from an individual's residence to recreation sites in the Chicago area was associated with lower levels of visitation and participation. In their study of intentions to re-visit an urban brownfield-to-park site in Ohio, Mowen and Confer (2003) found that the further visitors lived from the park, the lower their intentions to visit again. Our previous analysis of the study data (Vogt et al., 2015) using distance bands also showed that, compared to those living furthest from the site, those nearest to the site were more likely to visit. While spatial bands were used for our initial analysis, discussions with colleagues at NYC Parks (C. Grassi and D. Elliott, personal communication, January 27, 2012) suggested that ease of accessing the site (due to traffic patterns and congestion) rather than spatial distance alone may be a more central concern. Specifically it was

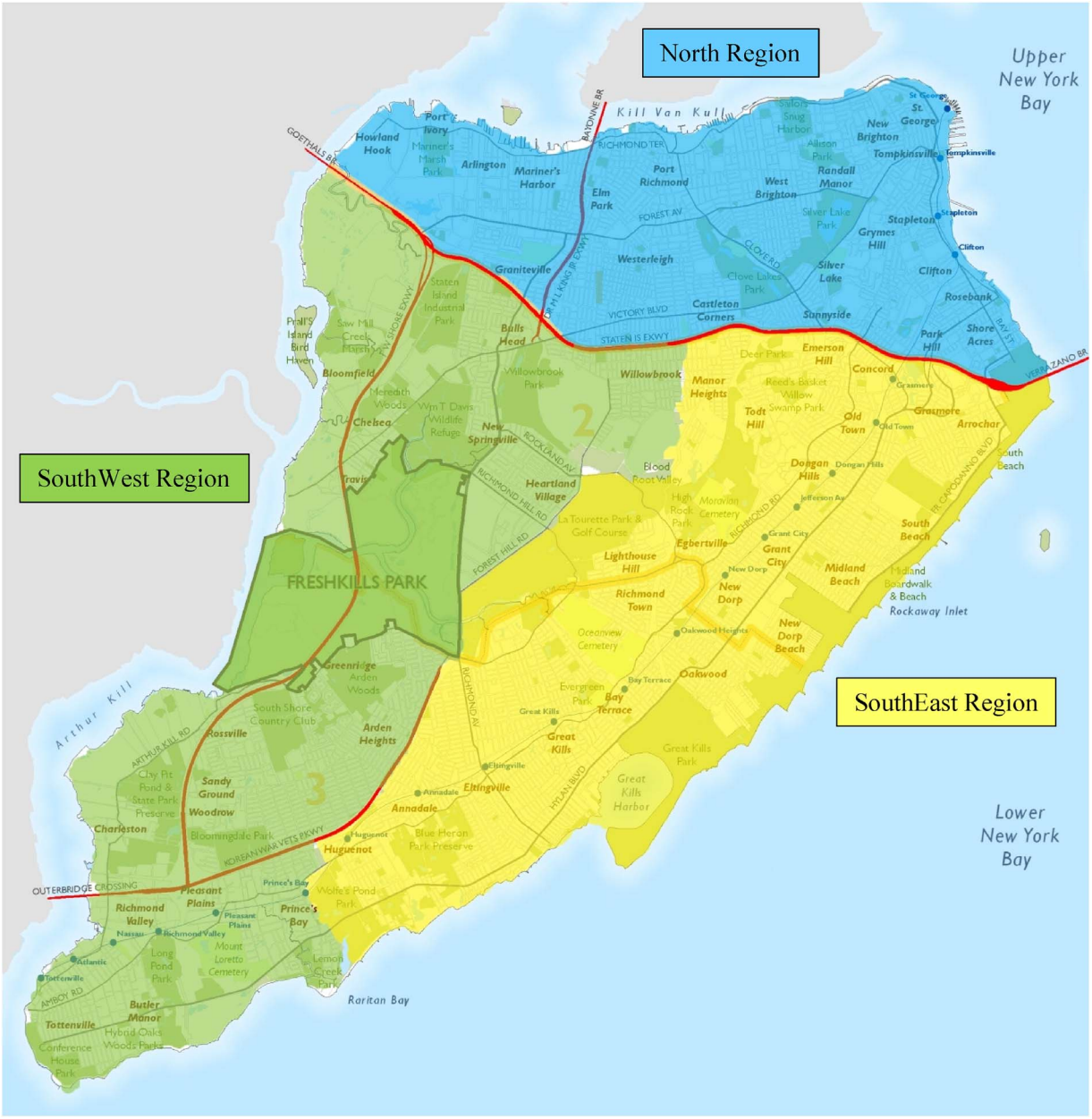

Fig. 2. Division of Staten Island into Neighborhood Regions used in Logistic Regression Analysis. Source: NYC Parks.

suggested that those in neighborhoods in the southwest region of SI, where FKP is located (several of which are adjacent to the site), would be most likely to visit. Conversely those living east of the park site and south of the Staten Island Expressway would be less likely to visit, and those in the northern part of SI and north of the Staten Island Expressway, would be least likely to visit. These neighborhood regions are shown in Fig. 2.

1.2.1.2. Households with children. Have been shown to visit urban parks more frequently than households without children. Maat and de Vries (2006) examined visitation patterns to urban green spaces in the Netherlands, finding that households with children have more frequent use patterns than households without children. Accordingly, we tested whether the presence of children in the household would have a positive influence on intentions to visit FKP.

1.2.1.3. Past park visitation. Past visitation to recreation sites has been shown to be a determinant of future behavioral intentions (Hammitt, Backlund, & Bixler, 2004). For instance, Mazursky (1989) found that intentions to visit a recreational cave site were positively influenced by prior experiences as measured by the number of past visits to other cave sites. Thus we anticipated that households that were in the habit of visiting other SI parks would be more likely to visit FKP.

1.2.1.4. Site experience/familiarity. Place attachment and sense of place have been increasingly explored as drivers of visitation behavior (Johnson, Glover, & Stewart, 2009; Williams, Patterson, Roggenbuck, & Watson, 1992). In the present study we explore whether accumulated experiences with the site or other landfill-to-park sites could lead respondents to form attachments which could influence intentions to visit FKP. Three types of experiences were examined. The first relates to experiences with the site when it was a landfill (i.e., working at or near FK, driving near FK, dropping off waste at FK, seeing trash being moved around at FK, smelling odors from FK, and participating in meetings/events related to the landfill's closure); the second relates to different types of involvement the respondent may

have had with the site since the landfill closed and the plans for the new park were being developed (i.e., reading about or talking to public officials about plans for the site, providing written comments or attending public meetings about plans for the site, participating in a group tour or community event at the site, visiting the NYC Parks FKP website, and subscribing to receive emails on the progress of FKP); and the third relates to experience visiting other landfill-to-park sites in the NYC region. We hypothesized that respondents who had more types of involvement with the site and its development would be more likely to visit; and that visitation to other local landfill-to-park sites might make people more willing to visit FKP due to familiarity with what to expect from a park developed at the site of a transformed landfill.

1.2.1.5. Use of recreation facilities and programming. The number and breadth of recreation opportunities and activity areas available at a park have been shown to positively influence visitation (Baran et al., 2014; Cohen et al., 2010; Neuvonen, Pouta, Puustinen, & Sievänen, 2010). In a recent investigation involving use of parks in low-income neighborhoods in Los Angeles (Cohen et al., 2016), the strongest predictor of increased park use was the presence of organized and supervised activities. Thus, we hypothesized that the types of recreation areas/facilities and recreational programming planned for FKP would have a positive influence on likelihood of visitation.

1.2.1.6. Health risk concerns. Parks built at former brownfield or landfill sites are designed to be safe for public use and adhere to strict public safety regulations. Nevertheless, use of these parks is often influenced by perceptions about health and environmental risks associated with past site uses (De Sousa, 2006; Levi & Kocher, 2006). Given the long history of the site as a municipal landfill, we hypothesized that beliefs about potential environmental health risks associated with visiting the site might act as visitation inhibitors, negatively influencing intentions to visit FKP.

1.2.1.7. Trust concerns. Concerns about risk and risk perceptions are often related to issues of trust. Research has shown that suspicion and mistrust regarding effectiveness of remediation efforts often surround brownfield redevelopment projects (De Sousa, 2003; Eiser, Stafford, Henneberry, & Catney, 2007; Slovic 1993). Given this possibility, we explore whether respondent trust with government entities involved with the site's development might also serve as an inhibitor to visitation.

2. Methods

Data for this analysis are drawn from a mail survey administered to a sample of 3300 SI residents during the summer of 2011. The survey was developed with input from staff at NYC Parks, researchers at the USDA Forest Service, and collaborators at the College of Staten Island; and informed by a series of focus group interviews with selected groups of SI residents. The survey was designed as a 12-page booklet with questions on: experiences and opinions about living on SI, familiarity and satisfaction towards current SI park areas, experiences with the site before and after the landfill closed, opinions on plans to develop the park, attitudes and intentions to visit FKP once it opens, interest in facilities and programs likely to be offered, familiarity with other landfill-to-park projects, and household demographics. The survey included a two-page informational insert that briefly described the history of the site and plans for its development. The insert included graphics and text outlining both short-term and long-term plans for FKP (further details on the survey can be found in Klenosky et al., 2012).

The sample population was drawn from three geographic bands defined by the approximate geographic center of the FKP site: within two miles (3.2 km) of FKP, between two and four miles (3.2–6.4 km) of FKP, and over four miles (6.4 km) from FKP. Residents of New Jersey or other NYC boroughs were not included in the population or sample. The sample was selected based on addresses rather than landline telephones, using a technique called address-based sampling (ABS) (Link, Battaglia, Frankel, Osborn, & Mokdad, 2008). In ABS, a random sample is drawn first from residential addresses; the addresses are then cross-listed with other databases (e.g., phone records, subscription databases.) to acquire residents' names, typically resulting in a 75–85% name match rate. Having access to actual names allows personalization of survey mailings and typically leads to increased response rates (Link et al., 2008). While most of those with name matches will have landlines; the inclusion of those without name matches provides a means of including cellphone-only households in the study sample. The ABS approach used in this research resulted in a study sample with an 89% name match rate.

Institutional Review Board approval was received from Purdue University prior to conducting the mail survey. The survey was administered following a modified Dillman (2000) procedure using three mailings: first mailing of the survey and cover letter with a $2 incentive, second mailing of a follow-up reminder postcard (sent two weeks from the initial mailing), and a third mailing with a second copy of the survey and second cover letter (sent approximately four weeks from the initial mailing). For those addresses with name matches, the cover letter and envelopes were addressed to "First-name Last-name or Current Resident at"; for those without name matches they were addressed to "Current Resident at". The salutation used in all the cover letters was "Dear Staten Island Resident".

As in our previous analysis (Vogt et al., 2015), we examined whether weights should be applied to the dataset. Specifically, the proportion of respondents in each sample band relative to the total number in the original sample was compared to the proportion of the population in each band relative to the total population on Staten Island. This analysis showed overrepresentation of those within two miles of FKP and underrepresentation of those over four miles from FKP. These over and under representations were minor and resulted in only slight differences between the un-weighted and weighted findings; thus no weights were applied in the present analysis.

A total of 1006 SI residents completed the survey, yielding an overall study response rate across the three mailings of 32%. Two approaches were used to examine potential non-response bias. The first compared study respondents and non-respondents based on the name match data available in the original sample frame. This analysis showed that the name match rate was slightly higher for respondents (93%) compared to non-respondents (87%); while statistically significant (X^2 = 26.250, df = 1), the impact of this difference was relatively minor. The second approach used to examine non-response bias compared differences in first (n = 791) and second wave (n = 215) study respondents on key demographic and study variables. This approach to assessing non-response bias suggests that respondents can be ordered on a continuum based on the amount of effort required to obtain a completed survey; and that those requiring the most effort (in this case, those requiring a second survey mailing) could be viewed as proxies for actual non-respondents (King et al., 2009). Using this approach, first and second survey wave respondents were compared on the following variables: sample band membership, gender, age, years as a SI resident, education, employment status, income, and likelihood of visiting FKP once it opens. In each case, no significant differences were observed across the two survey mailings. Taken together these analyses suggest that non-response bias was not a significant problem.

2.1. Measures

A binary dependent variable, IntentionsToVisitFKP, was created based on the question 'how likely would you be to visit FKP once it is open to the public.' Responses from a 5-point Likert scale were combined as follows: 'definitely would visit' and 'probably would visit' responses were recoded with the values 1 (likely to visit), while the remaining responses (i.e., not sure, probably would not visit, definitely

Table 1
Independent variables used in the Logistic Regression Analysis.

Variable name	Variable type	Description
Proximity	Categorical	Three categories based on the respondent's proximity to the park site: south of the SI Expressway and west of FKP (SouthWest), east of FKP and south of the SI Expressway (SouthEast), north of the SI Expressway (North)
Children in HH	Binary	Whether the respondent's household had at least one child under the age of 18 or not (No = 0/Yes = 1)
Past parks visitation	Continuous	The number of 17 SI parks the respondent had visited in the past 12 months (0–17)
Site experience/familiarity	Continuous	Three variables based on types of involvement with the site when it was an active landfill (InvolveOpen 0–7) and after the landfill had closed (InvolveClosed 0–8); and the number of other landfill-to-park sites in the NYC region (from a list of five) the respondent had ever visited (VisitOther 0–5)
Likely recreational use	Continuous	Likelihood of using different recreational facilities/areas (assessed on a five-point scale ranging from definitely would use, probably would use, not sure, probably would not use, and definitely would not use) and interest in attending different recreation programs (assessed on a five-point scale ranging from extremely interested to not at all interested) that might be available at FKP (Exploratory Factor Analysis and subsequent Correlation Analysis resulted in four variables: SportsActivities, PassiveSocialActivities, NaturePrograms, CulturalPrograms)
Health risk concerns	Categorical	Degree to which respondents agreed that they would be safe from health risks when visiting FKP (three categories[a]: HealthAgree, HealthNeutral, HealthDisagree)
Trust concerns	Categorical	Degree to which respondents agreed that they trusted the government agencies involved to do a good job managing the development of FKP (three categories[a]: TrustAgree, TrustNeutral, TrustDisagree)

[a] Responses were originally on five-point scales ranging from strongly agree to strongly disagree; three-level categorical variables were created by combining the top two responses for the "Agree" category and the lower two responses for the "Disagree" category.

would not visit) were recoded as 0 (unlikely to visit).

The independent variables examined in our analysis are summarized in Table 1. These variables correspond to the facilitators and inhibitors hypothesized to impact intentions to visit FKP.

2.2. Analysis

A binary logit model was developed to estimate the likelihood that SI residents will visit FKP and to examine the contribution of the independent variables on intentions to visit. We used the maximum likelihood estimation and the full model selection methods available in SAS 9.1. Responses to open-end questions about why respondents would or would not visit FKP are included in the discussion section. These responses were coded using Excel. Content codes were developed by one author inductively based on the themes, phrases, and words making up each response. The coding assignments were reviewed by a second author, yielding inter-coder agreement of approximately 95%. Disputes were resolved via joint discussion.

3. Results

3.1. Survey results

The demographic characteristics of the study sample are given in Table 2. The majority of respondents (76.4%) indicated that they probably or definitely would visit FKP once it is open to the public; just over ten percent were either not sure (12.2%) or indicated they probably or definitely would not visit (11.3%). Response to the health risk question indicated that almost a third (31.8%) either agreed or strongly agreed that they would be safe from health risks when visiting the FKP, just over a third (35.0%) were neutral, and the remainder (33.2%) either disagreed or strongly disagreed. Response to the trust question indicated that over four of ten (40.9%) either agreed or strongly agreed that they trusted the government agencies involved to do a good job managing the development of FKP, almost a third (32.8%) were neutral, and the remainder (26.3%) either disagreed or strongly disagreed.

Table 2
Demographic characteristics of the study respondents (n = 1006).

Variable	Percentage
Respondent gender	
Male	49.30%
Female	50.7
Respondent age	
18–24	0.50%
25–34	8.2
35–44	18.1
45–54	21.3
55–64	21.9
65–74	17.5
75 and over	10.8
Respondent race/ethnicity	
White not Hispanic	76.8%
White Hispanic	9.7
Asian/Pacific Islander	5.5
Black not Hispanic	4.9
Other	1.9
Respondent highest education completed	
Less than high school	2.3%
High school graduate	21.8
Technical school graduate	4.5
Some college	27.0
College degree (4-year degree)	23.6
Advanced/professional degree	20.9
Respondent household income	
Less than $25,000	13.9%
$25,000 to $49,999	18.7
$50,000 to $99,999	38.1
$100,000 or more	29.3
Respondent households with and without children < 18	
Single without children	18.1%
Couple without children	28.0
Three or more adults w/out children	20.6
Single with children < 18	2.5
Couple with children < 18	20.5
Three or more adults with children < 18	10.3

3.2. Logit model results

Correlations were calculated between each pair of variables; and variance inflation factors (VIFs) were examined to determine whether multicollinearity existed among explanatory variables. All partial correlations were less than 0.42 and all VIFs were less than 1.72, indicating multicollinearity was not a major problem. The log likelihood ratio test of the model was significant ($p < 0.001$), and the Hosmer-Lemeshow goodness-of-fit statistic was 0.8244, indicating an acceptable fit.

Six of the explanatory variables included in the model were significant at $p < 0.05$. Table 3 contains the regression coefficients, odds ratios, and marginal effects of the explanatory variables for the logit model. The probability of a SI resident visiting FKP is estimated to be 86% utilizing regression coefficients from Table 3 and mean values for each independent variable.

Table 3
Logistic Regression results examining the impact of potential facilitators and inhibitors on intentions to visit FKP.

Variable Name	Coefficient	Std Error	Odds Ratio	Marginal Effect	p value
Proximity					
SouthWest	1.0775**	0.3226	2.937	0.1186**	< 0.001
SouthEast	0.4596	0.2884	1.583	0.0556	0.111
North[a]					
Children in HH					
ChildInHH	0.0927	0.2545	1.097	0.0113	0.715
Past Parks Visitation					
NumParks	0.0807*	0.0363	1.084	0.0099*	0.026
Site Experience/Familiarity					
InvolveOpen	0.2704**	0.0995	1.310	0.0333**	0.007
InvolveClosed	0.1371	0.1469	1.147	0.0169	0.351
VisitOther	0.1560	0.1639	1.169	0.0192	0.341
Likely Recreational Use					
SportsActivities	0.1314	0.1248	1.140	0.0162	0.293
PassiveSocial	0.0621	0.1207	1.064	0.0077	0.607
NaturePrograms	0.0480	0.1223	1.049	0.0059	0.695
CulturalPrograms	−0.0803	0.1196	0.923	−0.0099	0.502
Health Risk Concerns					
HealthAgree[b]					
HealthNeutral	−0.3692	0.3617	0.691	−0.0474	0.307
HealthDisagree	−2.3659**	0.3480	0.094	−0.3782**	< 0.001
Trust Concerns					
TrustAgree[b]					
TrustNeutral	−0.7820*	0.3076	0.458	−0.1063*	0.011
TrustDisagree	−1.4449**	0.3195	0.236	−0.2247**	< 0.001
Intercept	1.2616**	0.4577			0.006
-2 log likelihood	470.364				
Hosmer-Lemeshow statistic	0.8244				

* $p < 0.05$.
** $p < 0.01$.
[a] North used as the reference condition for Proximity.
[b] Agree category used as the reference condition for Health Risk and Trust Concerns.

The logit model results indicate that proximity or residential location matters. Specifically, households located in the SouthWest region were 12% (marginal effect = 0.1186) more likely to intend to visit FKP than those north of the SI Expressway (North). Households which had visited other SI parks in the previous year were more likely to intend to visit FKP. The marginal effect indicates that the probability of intending to visit FKP increases by one percent for each of the 17 other SI parks visited.

Familiarity or involvement with the site when it was a landfill (InvolveOpen) had a positive relationship with intentions to visit. The marginal effect for this variable indicates that the probability of intending to visit increases by 3% for each of the seven types of possible involvement with the site when it was a landfill. Involvement with the site since the landfill closed (InvolveClosed) and visitation to other local landfill-to-park sites (VisitOther) had no statistically significant relationship with intentions to visit FKP.

Lack of trust in the government's ability to manage the development of FKP was found to be negatively related to intentions to visit. Specifically, individuals who were neutral or uncertain about whether they trusted the government agencies involved to do an appropriate job were 11% less likely to intend to visit than those who expressed trust in the government. Further, those who expressed a lack of trust were 23% less likely to intend to visit than those who expressed trust in the involved government agencies.

Beliefs about health risks associated with visiting FKP had a negative association with visitation intentions. Individuals who believed they would not be safe from health risks when visiting FKP were 38% less likely to intend to visit than those who believed they would be safe from health risks. None of the four variables representing intentions to utilize recreational areas/facilities or programming or the variable indicating households with children were significant.

4. Discussion

This study contributes to the literature on landscape change and the regeneration of urban brownfield and landfill sites for green space and recreation use (Zhang & Klenosky, 2016). More specifically, our analysis sheds light on the factors that might facilitate or inhibit visitation to a new park developed at the site of a former large-scale landfill.

The study results show that proximity or location influences visitation intentions, as has been previously reported in our initial analysis (Vogt et al., 2015) and in other studies in the recreation behavior literature. Results of the logit analysis revealed that residents in the southwestern section of SI, proximate to FKP, were more likely to visit FKP than those living in other sections of the island. Multiple explanations for this finding are possible. One, residents may not want to expend a great deal of travel time or effort to visit FKP. SI has many parks and green spaces. As such, residents have options when choosing to visit such areas. Thus, those living farther away may choose to visit parks that are closer or more easily accessible. Traffic congestion on SI was mentioned repeatedly in open-ended responses as an issue of concern, both associated with the development of FKP and on SI in general. Thus, real or perceived difficulties in accessing FKP may be a factor in these results, and a potential deterrent to visitation that park managers will need to address. Results from open-ended survey questions support this:

> "It's on the other side of SI and unless you are young, I believe north shore people will not use it like the south shore residents." Female,

70 years old.

"There is no park on this side of the island or anything like it. It would be nice to have a convenient place to take my child that is close to home." Male, 34.

Another explanation for the positive association between proximity and visitation may be that those SI residents living in the neighborhoods on the southwest shore may have had more opportunities to experience the site both as a landfill and during its transformation to a park. Consistent with our earlier investigation and past research (Mowen & Confer 2003), seeing the restoration of the landscape firsthand, particularly for longtime residents, could serve as a facilitator for visitation.

Consistent with prior research, results of our analysis found that SI residents already in the habit of visiting other SI parks are more likely to visit FKP. This finding raises two questions. One, will FKP reduce visitation at other SI parks for those in the habit of going to local parks, and two, will residents not in the habit of visiting local parks be persuaded to visit FKP? As Mowen and Confer (2003) suggest, whether residents decide to substitute visits to other SI parks with visits to FKP will ultimately be influenced by a variety of factors including relative satisfaction with FKP facilities and programming over near-by parks, relative ease of access, and concerns over safety and health. Further research will be needed to evaluate this question once visitors have had the opportunity to visit FKP.

We hypothesized that experience or familiarity with the site would facilitate intentions to visit FKP. Our analysis found that one of three independent variables used to test this hypothesis was statistically significant. Specifically, experiences with the site when it was a landfill (i.e., smelling odors, driving by, seeing trash, etc.) had a positive relationship with intentions to visit. This finding suggests the influence of a curiosity factor. Residents who have memories of dropping off waste at the landfill or seeing or smelling the landfill may be curious to see how an environmental disamenity with so many negative connotations could be transformed into an amenity with desirable features. Responses to open-ended questions in the survey support this possibility:

"I would be curious to see how it was transformed into a park." Male, 53.

"Having lived here for 26 years and having put up with the disgusting smells, I would be extremely curious to see this project come to fruition." Male, 60.

Our findings suggest that a lack of trust in the government agencies involved in overseeing the development of the site could be an inhibitor to visitation at FKP. Our analysis showed that respondents who indicated a lack of trust in agencies' ability to manage site development were 23% less likely to intend to visit FKP than those who professed trust. Additionally, those who were neutral or uncertain in their trust were 11% less likely to intend to visit FKP than those professing trust. One implication of this finding is that those with uncertain trust beliefs are distinct from those with either positive or negative beliefs. Park managers will be challenged to overcome concerns about trust in attracting some segments of visitors. Winter, Vogt, and McCaffrey (2004) found that trust is most closely associated with perceived competency of those involved in natural resource mitigation efforts and the belief that the mitigation efforts will lead to the desired and promised outcomes. Response to other survey questions indicated that SI residents have greater trust in local SI borough agencies' ability to make proper decisions about the development of FKP compared to government agencies at the city or state level. Thus, park managers might capitalize on this tendency by partnering with local SI government sources (versus other government sources) when conveying messages about site development. Trust came up frequently in responses to open-ended questions:

"My curiosity would make me visit the site, but my mind would say it's still toxic and the government and businesses that sponsored it cannot be trusted." Female, 59.

"Although the landfill has been capped, I don't trust that any government agency has done the proper amount of tests regarding the residual toxins in the area. I absolutely would not allow my children to go there." Male, 45.

Health concerns loom large as a potential inhibitor to visitation. Residents who believe they will not be safe from health risks when visiting FKP are 38% less likely to intend to visit. Interestingly, respondents who are uncertain about potential health risks are no less likely to intend to visit FKP than those who believe they will be safe from health risks. Thus, park managers may not have to unequivocally convince potential visitors that they will be free from health risks when visiting FKP. It will, however, be important that FKP acknowledge health concerns and show evidence that efforts were taken to prevent health risks. Transparency in monitoring of health risks at the site from internal and independent external sources may be needed to gain public trust. Many comments were made in open-ended questions regarding concerns about potential health risks:

"My primary concern is about short term and long term safety, specifically as it relates to exposure to known and unknown toxins. If a credible evaluation is performed and potential risks are communicated, and not downplayed or dismissed, I am amenable to visiting the park." Male, 48.

The insignificance of the variables associated with the likelihood of using the recreation facilities/areas and programming planned for FKP suggests that recreation interests are not a good predictor of visitation at FKP at this point in its development. We argue, however, that this finding likely relates to initial visitation at the park, rather than long-term visitation. The insignificance of the recreational use variables is further evidence that potential visitors to FKP are more motivated at this point by curiosity about the site's conversion from a landfill to be avoided to a park to use and enjoy. Specific facilities and activities available at this early stage might be less of a concern to the public, but they are of great interest to planners who need to consider development options. Once the curiosity associated with FKP wears off, we would expect that recreational offerings and programs would have an important influence on decision to make repeat visits to FKP. Literature shows that park amenities and offerings are key determinants of visitation (e.g., Cohen et al., 2016; Neuvonen et al., 2010).

While we anticipated that households with children might be more likely to visit FKP, the logit results did not bear that out. While parks might be attractive places for children in general, comments from open-ended questions suggest that concerns about potential health risks at FKP to children specifically may be a significant impediment to visitation:

"Mostly concerned about the children and what consequences this project may cause." Female 27.

"Would have to feel confident that it was a safe place to visit with my grandchildren." Male, 57.

The implication of this finding is that if FKP administrators aim to make FKP a family destination, they will need to be able to make convincing arguments that it is safe for all to visit.

Overall, our analysis suggests that curiosity will be a strong draw for initial visits to FKP, perhaps initially overriding the particular features, resources, amenities, and programming offered or concerns about safety and health. Curiosity/novelty has been found to be a strong "pull factor" in the travel and tourism literature (Crompton, 1979; Klenosky, 2002). Nevertheless, once the initial curiosity about FKP is satisfied, the key question is: will visitors return? Comments provided by respondents echo this:

"I would be interested in visiting, at first, to see what was created and thereafter to see if the area might be applicable to my needs." Male, 65.

"I would probably go check it out when it is finished. Depending on how I feel about it when I see it would determine if I would visit again." Female, 27.

A powerful element of FKP is the transformative nature of the project. Results of our survey indicate that many SI residents view the development of FKP as much more than just a new place to have a picnic or ride a bike. In response to other survey questions, 73% thought that the development of FKP would improve the quality of the natural environment of SI, 67% thought it would improve SI's reputation as a place to live and visit, and 60% believed it would improve the quality of life of SI residents. Thus, residents see the park as not only transforming the physical landscape, but also positively transforming their lives and community; and as such helping to redress residents' concerns about environmental and social in-justice. Comments from the survey underscore this sentiment:

"It is about time that SI'ers have something to look forward to because we feel like the forgotten borough. This park will change what the rest of the people think of SI. I can't wait to be proud once again of being a SI'er." Male, 60.

"Develop the park − end the landfill jokes − and bring some pride to this island." Male, 33.

5. Conclusions

Our analysis should be useful to landscape architects and park designers, planners, and managers as they consider ways to encourage visitation and enhance visitation experiences at FKP. First, the pattern of results suggests that curiosity about the site's transformation will be a strong draw for visitors. Our findings show that a large percentage of SI residents will likely visit FKP, at least once, regardless of the types of facilities and programming planned and in spite of concerns regarding health risks. People simply want to see it for themselves and visit the world's largest former landfill. Capitalizing on this curiosity by emphasizing the sites' history and engineering in marketing and interpretive materials could be one way of encouraging initial visitation. A key challenge for park administrators will be how or whether this initial curiosity can be harnessed to cultivate repeat visitation and long-term loyalty. To reach its full potential, FKP will have to be as viewed as more than a one-time novelty destination.

In spite of curiosity and stated intentions to visit, respondents still voiced significant concern regarding safety and health, and some lacked trust in government agencies to oversee the transformation process. Thus, satisfactorily addressing these concerns will be an important determinant in whether visitors make this a repeat destination. It is clear from the survey that FKP will need to have a risk communication plan and a strategy for demonstrating the efficacy of the technologies and science utilized in the site's transformation. People are skeptical about safety and health risks at the site, yet willing to give it at least one chance. Thus, it will be important for on-site interpretative materials, demonstration projects, park personnel, and park websites to be prepared to confront these concerns head-on. Recent discussions with NYC Parks personnel (C. Field, personal communication, September, 15, 2016) indicate that FKP administrators have already begun to address these issues. Public health and safety information are posted on the FKP website, along with the Final Generic Environmental Impact Statement and detailed information about landfill closure infrastructure. In addition, FKP staff are pursuing initiatives to communicate these issues to the public via social media channels and the popular press, often in conjunction with staff from the NYC Department of Sanitation's Engineering division. Finally, a variety of outreach and education programs are being developed, including a water monitoring program with area school students initiated in 2016 (Freshkills Park Alliance, 2016). FKP staff have worked to build trust through a range of strategies, including by partnering with non-governmental actors. The Freskhills Park Alliance is a private nonprofit that works to raise public awareness and build a constituency for the site through arts, science, and public programs. For example, NYC Parks works with the Alliance to hold public visitation days and special events (e.g., "Sneak Peaks") on closed portions of the landfill to educate visitors about the site and the park transformation process.

One of the challenges in this study was trying to estimate intentions to visit a park that had yet to be built or visited. The tourism and recreation literature on repeat visitation suggests that factors such as visitor satisfaction with the initial visit, tourist motivations for choosing a tourism/recreation site, prior experiences with the destination, clustering of attractions and other services, and visitor attachment to a site influence one's decision to revisit a destination (Alegre & Cladera, 2009; Um, Chon, & Ro, 2006; Yoon & Uysal, 2005). In order to predict long-term visitation or determinants of visitor loyalty at FKP, data will need to be collected from actual park visitors about their satisfaction with the visitation experience, as well as their beliefs about safety and health risks after visiting the site. Comparing the findings from these future efforts with this baseline investigation will provide an opportunity to determine how these beliefs might have changed over time.

By virtue of its location in a major urban area, FKP has the potential to play an important role in providing social, environmental, and recreation benefits in its community. A key question for FKP, as well as the broader urban and recreational planning community, is whether such transformed spaces will be viewed as desirable places to visit and use. Will people visit FKP? Will they be able to get beyond what the site used to be? While time will bear out long-term visitation patterns, it appears that at its genesis, many SI residents are hopeful about FKP and willing to give it a chance, as one respondent stated:

"If you build it, we will come." Female, 34.

Finally, landscape, park, and urban planning researchers are encouraged to consider the facilitators-inhibitors framework employed in this study in future investigations. While the features and desirable elements developed at a green space and park areas (which typically receive primary research attention), may well serve as facilitators that attract visitation and use, it is important to consider the impact of other elements, including those associated with a site's history and conversion, that may inhibit or deter these behaviors. This perspective holds potential for use in other landscape change and park visitation studies; especially those involving the transformation of other landfill, brownfield, and environmental disamenity sites (e.g., former transportation corridors such as the High Line Park in NYC and the Sentier Nature in Paris; and military facilities such as the Presidio in San Francisco and the Midewin National Tallgrass Prairie near Joliet, Illinois) into amenities that serve as important recreational resources as well as engines for responsible urban and ecological renewal (e.g., Curran & Hamilton, 2012; Foster, 2010; Wolch et al., 2014)

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