

Provision of Activity-Promoting Public Open Spaces: the Critical Role of Development Control

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Abstract

Planned neighborhoods in Trinidad, developed by the state's Housing Development Corporation (HDC) were often observed to lack public open spaces (POS) with features which were likely to promote physical activity in children and adolescents. The development control process at the urban and regional planning agency was hypothesized to be ineffective in ensuring the provision of such POS. The study examined the agency's planning guidelines for the provision of POS within three state-planned neighborhoods in Port of Spain and the Capital Region. The HDC housing database was used to identify state-planned neighborhoods within the study area. Approved subdivision layouts at the planning agency, together with 2007 satellite imagery were used to identify the POS within the neighborhoods. The Children's POS Tool (C-POST) used in a related study in Melbourne, Australia was modified and used to audit the features of each of the POS. The outcomes were assessed against the planning guidelines of the urban and regional planning agency.

The neighborhoods lacked the required activity-promoting features, especially for adolescents, with this situation existing from the time people took up residence within the neighborhoods. There were also deficiencies in the provision of supporting amenities. The study concluded that the planning guidelines at the urban and regional planning agency did not effectively ensure the provision of POS with features which were likely to promote physical activity in children and adolescents.

The findings have significant implications for the promotion of physical activity in children and adolescents and in the ultimate reduction in the rise of non-communicable diseases (NCDs) in the Caribbean. It also has critical implications for the role of development control and good planning practice in facilitating physical activity through the provision of active POS, and in the achievement of healthy and sustainable communities in the region.

Introduction

The Caribbean is characterized by a variety of human settlements. They are the collections of people in spaces like cities and neighborhoods with components that sustain the settlements and help to meet the basic needs of people within them (UN - Habitat 1976). Developed by State or by private-sector developers, human settlements foster improvement in the quality of peoples' lives and facilitate development while being an objective of development (UN - Habitat 1976). Ideally they are sustainable, equally emphasizing economic security, environmental health, and social wellbeing (Institute for Sustainable Communities n.d.). People are expected to remain physically active and healthy within human settlements.

However, health professionals identified a major health epidemic in Caribbean human settlements. The Caribbean Public Health Agency (CARPHA) highlighted a public health crisis regarding unhealthy weights and obesity, in children and adolescents. Obesity rates were near to or above the global average with no less than one in every five children in the Caribbean Community (CARICOM) overweight and destined for chronic non-communicable diseases (NCDs) as adults (Caribbean Public Health Agency 2015). Childhood obesity had risen acutely (Pan American Health Organization/World Health Organization 2011). This is critical since as children and adolescents developed, involvement in physical activity dwindled (National Heart Foundation of Australia 2014). Also, youth obesity in the Caribbean was projected to persist into adulthood, ultimately leading to chronic NCDs like hypertension, obesity, diabetes, and cardiovascular problems (Caribbean Public Health Agency 2015). Hence, there was an

epidemic of chronic NCDs in the Caribbean that was the worst in the Americas (Pan American Health Organization/World Health Organization 2011).

Additionally, there were direct and indirect costs to individuals, families, and the CARICOM associated with the epidemic (Caribbean Public Health Agency 2015). Direct costs included national and family health care expenditure, and poverty resulting from the treatment of family members with NCDs, over their lifetime (World Health Organization 2011). Further, diabetes and hypertension were estimated to cost the Caribbean \$1.3 billion yearly; about three to eight per cent of GDP (Hospedales 2015). Indirect costs included loss of productivity due to employees' illnesses. The CARPHA in its Plan of Action for Promoting Healthy Weights: 2014 – 2019 pledged to turnaround the upward trend regarding obesity in children and adolescents by 2025, and agreed to help deal with the costs of NCDs to the region.

Obesity and NCDs in children and adolescents are associated with the provision of activity-promoting public open space within human settlements. Public open spaces potentially facilitated physical activity required by youths and adults (Bedimo-Rung, Mowen and Cohen 2005). Decreased physical activity has been associated with insufficient opportunities for outdoor recreation (Kellett and Rofe 2009), and with rising obesity rates among children and adolescents (Ellaway, et al. 2007). In 2007 CARICOM leaders agreed to manage chronic NCDs in the region (Caribbean Community Secretariat 2007) and to help increase physical activity, leading to health improvement. They commissioned a report which urged the provision of recreational facilities in all neighborhoods, specifically to benefit young people (Caribbean Community Secretariat 2010). The government of Trinidad and Tobago separately, expressed its concern (Ministry of Planning and the Economy 2011); and Commonwealth government leaders in 2009 affirmed their commitment to treating with the growing epidemic of NCDs; stressing the importance of public open spaces for physical activity (Healthy Caribbean Coalition n.d). Physically active persons are more likely to be healthier and gain enhanced well-being.

Studies worldwide addressed the inadequate provision of required public open spaces. They examined provision of public open space based on neighborhood socioeconomic status (SES), as well as activity-promoting facilities (Crawford, et al. 2007) that improved health. Much of the research though was undertaken primarily from a public health perspective (Kellett and Rofe 2009).

Land use planning professionals therefore, need to be more proactive in treating with public health issues in the built environment and assist in researching appropriate interventions. Such involvement would not be new since the modern history of town planning was grounded in the treatment of social concerns (Crot 2010; Rohe 2009) in urban spaces. City planning in Britain in the nineteenth century addressed public health concerns (Taylor 1998) and in the mid-nineteenth century a close nexus existed between public health and urban planning concerns. The two disciplines had a common root (Crawford 2010) but they drifted apart. However, a realignment has been occurring in light of current issues in urban settlements (Ricklin and Kushner n.d.) and the drive to create healthy, sustainable, human settlements (Duhl and Sanchez 1999). A return to urban planning's early moorings would accord with the efforts of early pioneers like Ebenezer Howard and Patrick Geddes, who helped foster the notion of a relationship between urban planning and public health.

The Problem

The development control process at the State's spatial planning agency in Trinidad and Tobago is expected to help facilitate the provision of activity-promoting public open spaces. This researcher, a senior planning officer at the Town and Country Planning Division (TCPD) for many years, observed that similar to the private sector, state-planned neighborhoods were deficient in public open spaces (Kirk 2013). In spite of a formal development control process, many did not have activity-promoting recreational facilities for children and adolescents. This is of great concern in light of the Caribbean epidemic of youth obesity and chronic NCDs, and the need to promote physical activity in children and

adolescents. But, it appeared that the State's spatial planning agency was unaware whether the development control process ensured the provision of public open spaces with features that were likely to promote physical activity in children and adolescents, within state-planned neighborhoods in Trinidad.

Background of the Problem

Sustainability and Urban Human Settlements

The notion of sustainable development has been significant in the development of human settlements, since the 1987 publication of the report of the World Commission on Environment and Development. Sustainable development is "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations 1987, 41). Economic and social development should occur in the context of preservation of the environment and concern for the well-being of future generations (Barlund n.d.). As urban settlements are planned, the goal of sustainability should always be in focus. The United Nations' 2030 Agenda for Sustainable Development helps foster this goal and outlines a global action plan for the transformation of all countries (United Nations 2015). Seventeen Sustainable Development Goals (SDGs) were agreed to, intending to further the progress of the previous Millennium development Goals (MDGs) (United Nations 2015). Goal 11 was aimed at sustainable human settlements with safe, accessible, and inclusive public open spaces; while Goal 3 promoted the health and well-being of all people, with the UN aiming to decrease, by one third, premature deaths due to NCDs by the year 2030. The UN is therefore concerned about the prevalence of NCDs and the provision of public open spaces, as it promotes sustainable human settlements.

Public Open Spaces and Urban Human Settlements

Public open spaces are generally accessible to everyone (Saalman 1968), and provide recreational opportunities (Kellett and Rofe 2009) for passive and active recreation (Healthy Active by Design 2014). They include squares (Audirac 2010), recreational grounds (Town and Country Planning Division 1989), parks, playlots (Kellett and Rofe 2009), and streets and sidewalks (Chapman 2010). Activity-promoting recreational facilities include play equipment for children (Commission for Architecture and the Built Environment 2009), cricket pitches and football fields (Town and Country Planning Division 1989), cycle tracks (Caribbean Community Secretariat 2007a), walking and running paths, and hardcourts for ball games (City of New York 2010).

Users of public open spaces benefit physically, socially, mentally (Ellaway, et al. 2007), environmentally (Fawver 2007), and spiritually (Caribbean Community 2007a; Fawver 2007). Social benefits are gained through social interaction (Faizi, Hosseini and Maleki 2011). Psychological benefits include enjoyment of nature, combating urban stress (Kellett and Rofe 2009), relaxation (Faizi, Hosseini and Maleki 2011), and improvement in mental and psychological health (Caribbean Community Secretariat 2011; de Vries, et al. 2003). Public open spaces also facilitate youths moving from indoors (Fawver 2007) attracted by natural greenery, to use outdoor open spaces (Sullivan, Kuo and Depooter 2004).

The promotion of physical activity is key to preventing and controlling chronic illnesses (National Heart Foundation of Australia 2014). Public open space facilitates physical activity (Kellett and Rofe 2009), physical exercise (Faizi, Hosseini and Maleki 2011), and casual outdoor play by children (Smoyer-Tomic, Hewko and Hodgson 2004). Increased physical activity promotes physical health and wellness (Kellett and Rofe 2009; Mason 2010); fosters healthier lifestyles as preventative medicine (Caribbean Community Secretariat 2011); and assists in lowering incidences of premature deaths, obesity, and chronic NCDs (Caribbean Community Secretariat 2007a; Caribbean Public Health Agency 2015; Kellett and Rofe 2009). Active public open spaces are critical since NCDs took the most lives globally, at 63% or over 36 million each year (World Health Organization 2013); and one quarter of NCD-related deaths occurred before age 60 years (World Health Organization 2011).

Development Control and Provision of Public Open Spaces in Trinidad

In Trinidad and Tobago the development control process at the planning agency, the Town and Country Planning Division (TCPD), operates within a legislative framework. The Town and Country Planning Act, Chapter 35:01 regulates urban and regional planning, with a Minister being responsible for such planning (Laws of Trinidad and Tobago 1969). The TCPD acts on behalf of the Minister and prepares land use plans, policies, development standards, and guidelines. Among other things, these facilitate the design and development of human settlements, the provision of necessary services, and the safeguarding of public health (Town and Country Planning Division 1989). The TCPD processes applications for planning permission to develop land.

All development as defined by the Planning Act requires prior planning permission. Anyone could apply to the Minister by submitting an application to the TCPD. Planning officers guide developers to ensure development of sustainable neighborhoods. Typically, when planning permission is granted it is assumed that all requirements were met. Planning permission may also be granted based on an outline application (Laws of Trinidad and Tobago 1969). This permission provides guidance on the conditions which must be met when submitting applications for full planning permission. Before approval is granted the advice or approval of other government agencies may be required. A planning permission grants approval from a land use perspective, and developers are required to satisfy the requirements of other pertinent legislation (Town and Country Planning Division 1989). Before any land development could proceed, applications approved at the TCPD also need the approval of the relevant Regional Corporation.

The development control process also makes provisions for the Minister to take enforcement action when development was undertaken without planning permission or implemented contrary to stipulated conditions (Laws of Trinidad and Tobago 1969). However, there have been complaints that enforcement procedures have largely been ineffective. Suite (1985) argued that the TCPD lacked adequate human resources to effectively monitor and enforce its regulations. This was significant since, unapproved and unplanned settlements often lack neighborhood facilities. Usually unless state agencies intervene residents are left without relevant facilities.

Nevertheless, in spite of the development control process, state-planned neighborhoods lacked public open spaces and relevant activity-promoting facilities. Residents complained about the situation (Sookraj 2010). Suite (1985) also noted that this deprivation was a perennial problem in Trinidad's public sector housing. In a study of houses constructed during 1973-1984, Suite (1985) observed that developers focused on the provision of houses and not public open spaces. They grudgingly allocated only the minimum amount of land required by the planning agency, and often such spaces were unsuited for recreation. Allocated spaces remained undeveloped, became overgrown with bush, evolved into dump sites and spaces for criminal activities, or developers returned to the planning agency to change the use of the sites for residential purposes (Suite 1985). In spite of relevant planning guidelines, children and adolescents within state-planned neighborhoods, as well as those developed by private sector developers, were robbed of opportunities for physical activity.

Purpose of the Study

The purpose of the paper is to examine whether planning guidelines at the State's planning agency, ensured the provision of public open spaces with features that were likely to promote physical activity in children and adolescents, within three state-planned neighborhoods in the Capital Region of Trinidad. In this study, provision refers to allocation and development of public open spaces with relevant activity-promoting features.

Significance of the Study

The study has significance for spatial planning professionals. Planning professionals shape and modify geographic space (Carmona, et al. 2003) to achieve specific ends (Crot 2010); they impact physical activity and health through neighborhood design (City of New York 2010); their decisions influence availability of active public open spaces (Kellett and Rofe 2009); and their actions have intended and unintended consequences and potentially prevent and contribute to good health (Duhl and Sanchez 1999). The study could help to: (i) raise awareness about the Caribbean epidemic of chronic NCDs; (ii) reinforce the importance of designing neighborhoods that are conducive to active living; and (iii) motivate planning professionals to urgently join health professionals in dealing with public health issues that are impacted by the built environment.

The study also has significance for the State's spatial planning agency. Research-driven man-made interventions are needed in what is a man-made epidemic (Caribbean Public Health Agency 2015). The study could: (i) promote awareness of the need to review the development control process, specifically as it relates to guidelines for the provision of active public open spaces; and (ii) could help the planning agency to initiate or get involved in the multi-sectoral, multi-level, and multi-stakeholder collaboration that is needed in the fight against chronic NCDs.

There is theoretical significance to the study too. Kellett and Rofe (2009) observed that investigation into the association between health and the provision of public open space had long been led by public health researchers. Thorough integration of public health matters into urban planning work and policy was required (Duhl and Sanchez 1999) and in light of the global public health focus on chronic diseases, land use professionals had a critical role to play (City of New York 2010). The study could help persuade planning academics and professionals to conduct relevant planning research, and further frame the discussions on public health and the built environment, within a land use planning framework.

Design and Method

The case study research methodology was used in the study to explore and provide a description of the planning situation, through gathering and presenting of information (Writing@CSU 2016). According to Bakogiannis, et al. (2014) this methodological approach is useful for researching issues of public health and urban planning, and helpful when examining implementation of policies to determine their impacts. Hence, it was appropriate for examining the gap between the planning guidelines of the TCPD and implementation by planning practitioners and other allied professionals. It is also a useful tool for communicating planning issues with other stakeholders and decision makers (Bakogiannis, et al. 2014), and appropriate for studying neighborhoods and public agencies (Yin 1994).

Case study research strategy has some limitations which can impact the results of the study. The findings cannot be easily generalized beyond the specific cases; but time constraints did not permit use of a research strategy that facilitated examination of more state-planned neighborhoods. However, the findings were adequate to address the appropriateness of the planning guidelines at the planning agency. There was also possible research bias. The researcher therefore ensured all data and evidence were collected fairly (Yin 1994); and, in order to corroborate data collected, the researcher interviewed one resident of the main case study site, who was among the first home owners in the development. An audit tool was also designed and administered by the researcher to ensure standardization of the data collected in each public open space.

Definition of Wider Study Area

The Capital Region (Town and Country Planning Division 1975a) was chosen as the wider study area since it is the most urbanized area in the nation and contains settlements with the highest population densities. These urban settlements form a linear pattern along the major east-west arterial route. The boundaries are shown in figure 1. Port of Spain is its core and provides the highest levels of all national

services, and the Capital Region plays a significant role in the socioeconomic and political development of the nation.

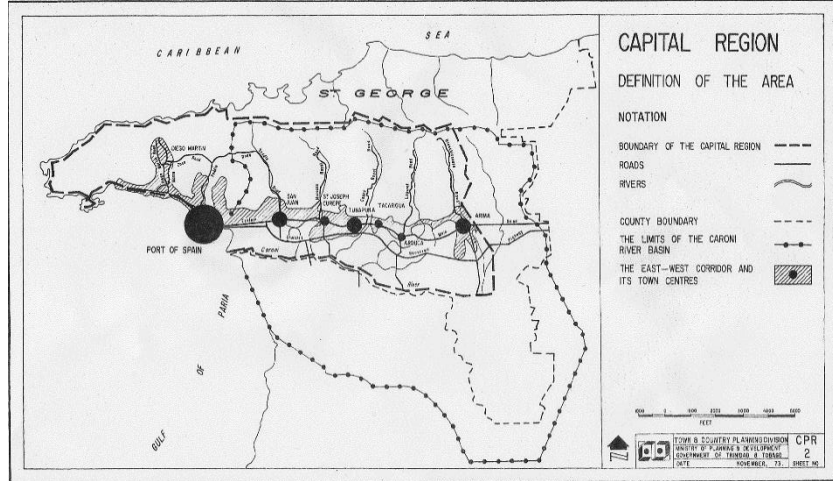


Figure 1: The Capital Region

Source: Town and Country Planning Division. 1975a. *Planning for Regional Development: The Capital Region*.

There are many state-planned settlements within the Capital Region. These are managed by the Housing Development Corporation (HDC), which was established in 1963 as the National Housing Authority (Town and Country Planning Division 1975b). There are approximately 90 neighborhoods on sites that are vested with the HDC. The neighborhoods vary in size with two of the larger neighborhoods each containing over 2000 dwelling units. Data was unavailable for seven neighborhoods. The HDC also manages 48 sites mainly in Port of Spain, with 3707 units within multistoried rental apartment buildings. These buildings were constructed between 1948 and 1986.

Case Study Sites

Three state-planned neighborhoods were chosen as case sites within the Capital Region. Figure 2 shows the Diamond Vale Development in Diego Martin which was the main case site. It was chosen because (i) it was among the oldest state-developed neighborhood, (ii) it was an example of a relatively well-planned urban neighborhood (Town and Country Planning Division 1989, 62), and (iii) the public open spaces were developed over time. The neighborhood was initiated by private-sector developers (Kissoon, 50 Years in the Vale 2012), but became a State-developed neighborhood by 1961 (When a Diamond Vale House Cost \$10,000 2012). Its initial development predated the establishment of the TCPD and the Town and Country Planning Act of 1969.

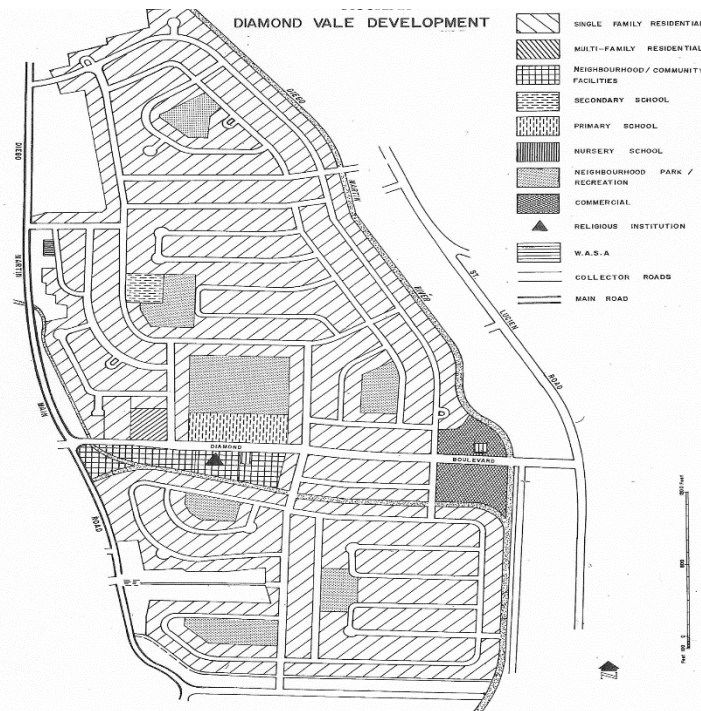


Figure 2: Diamond Vale Development
 Source: Town and Country Planning Division. 1984. *National Physical Development Plan: Trinidad and Tobago*. Vol. 1. 2 vols. Port of Spain: Ministry of Finance and Planning, Government of the Republic of Trinidad and Tobago.

Approximately 94.2 hectares in size, the development is located on the western end of the Capital Region and has 1716 dwelling units. There are also parks and recreation grounds with varying levels of recreational facilities. Residents boasted of the success of this neighborhood as a planned urban neighborhood (Mills 2010).

Trestrail Estate in D’Abadie was chosen because: (i) it was the most recently approved and received full planning permission, and (ii) the site was still vacant when the application was approved. The proposed human settlement is located within the eastern portion of the Capital Region, consists of 51.0 hectares, proposes 1206 dwelling units, and promises public open spaces of different sizes and types.

Greenvale Park in La Horquetta was selected because (i) its application, approved in 2014, was also among the most recent approvals for state-planned neighborhoods in the Capital Region; and (ii) records showed that when full planning permission was granted the houses were already constructed. Greenvale Park is also located toward the eastern end of the Capital Region, on 52.30 hectares. It proposed 591 dwelling units and public open spaces of different sizes and types.

Public Open Spaces Data

Data were obtained from HDC database, TCPD records, and an audit tool which was designed for this study. In February 2016, the HDC was emailed and a request was made for information pertaining to the state neighborhoods within the Capital Region. This included site location, site area, date the development was approved and implemented, number of residential units, and details of the public open space and type of recreational facilities provided. The data received excluded information about approval dates or the public open spaces, since much of this data was unavailable or incomplete. The records of the TCPD were checked but information relating to the initial approval of many of the older

developments was unavailable as they pre-dated the establishment of the TCPD in 1963 and the Town and Country Planning Act of 1969. However, application files were available for Greenvale Park and Trestrail Estate, and approved subdivision layouts were used to identify the proposed public open spaces.

Planning Guidelines for Activity-Promoting Public Open Spaces

The development control process of the TCPD includes planning guidelines to ensure requisite public open spaces are provided. Two sets of guidelines considered in this study were: (i) guidelines for allocation and preparation of public open spaces and recreational facilities, and (ii) guidelines related to activity-promoting features. These requirements were given in the Guide to Developers and Applicants for Planning Permission; they were provided as conditions when Outline Planning Permission was granted; and planning officers advised developers about these obligations during consultations.

Guidelines for allocation and development of public open spaces and recreational facilities.

The developer was obligated to do the following:

- Allocate land for multiuse public open spaces and recreational facilities;
- Provide on submission, information on the type of recreational facilities to be provided;
- Provide on submission, proposals for the development of the open spaces and recreational facilities simultaneously with the construction of the housing units;
- Complete all or the majority of public open spaces and recreational facilities while the residential units were under construction, and before they were occupied;
- Maintain the public open spaces until different arrangements were made after completing the planned development.
- Provide supporting amenities and safety measures within public open spaces

Guidelines for activity-promoting features.

The developer was obligated to provide the following:

- Hard courts for games like lawn tennis, netball, and basketball;
- Play equipment for children and adolescents;
- Football fields, cricket pitches, and other activity-promoting facilities within local recreation grounds;
- Cycle and walking paths.

Public Open Space Audit

An instrument was developed to audit activity-promoting features in the public open spaces. The Public Open Space Audit Tool (POST) was a modification of the CLAN Public Open Space Audit Tool (C-POST), derived from the Children Living in Active Neighborhood (CLAN) Study undertaken in Melbourne Australia in 2004 (Crawford, et al. 2007). A copy of the C-POST Audit Tool was requested from the authors and referenced in previous work by this researcher (Kirk 2013). The Australian study involved children ages five to six years and 10–12 years; the items on the audit instrument were already determined to potentially promote physical activity in children (Crawford, et al. 2007). The age group 10–12 years is within the early adolescence period of ages 11–14 (American Academy of Pediatrics n.d.). This 11-14 age group is the adolescence period being considered in this study. The features of public open space assessed in the audit instrument are shown in Table 1. They reflect the guidelines provided by the spatial planning agency, for activity-promoting features. The instrument was administered within the Diamond Vale Development by the researcher, on 13th March, 2016 following a previous pilot audit and subsequent revision of the audit tool.

Table 1: Features Assessed Using the Public Open Space Audit Tool

Access	Recreational Facilities	Amenities
Multiple points of entry to the POS	Path suitable for walking	Pavilion
24hr access	Path suitable for cycling	Benches
Cycle path linked to POS	Lights on paths	Pipe-borne water
Pedestrian access / Pavement	Park / play lot	Toilets
Play Equipment	Park / play lot lighted	Natural shading
Climbing frame	Basketball court	Manmade shading
Hanging bars/rings	Netball court	
Monkey bars	Tennis court	Safety
Roundabout	Half/part court	POS facing houses or street
Sand pit	Lights on courts	POS centrally located
See-saw	Football field	POS Fenced
Slide	Cricket pitch	
Swing	Lights on playing fields	
Other	Swimming pool	
Suitable for 5 - 9 year old	Indoor sports/recreation complex	
Suitable for 10 – 14 year old	Flat grassed area	
	Exercise equipment	

Results

The audit tool was used at Diamond Vale to assess activity-promoting features, and two sets of the guidelines for the allocation and development of public open spaces and recreational facilities.

There were six parks and one community pool complex in Diamond Vale Development. All the parks had more than one entry points, and pavements for pedestrian access; none had linked cycle paths nor 24-hour access. The open spaces were centrally located within the various smaller neighborhoods; four parks were fenced and all were facing a road or houses on at least one side.

Open spaces varied regarding recreational facilities. The six parks contained lighted walking paths and two had separate play lots that were also equipped with lights. Three parks contained football grounds, and two had small cricket pitches. These playgrounds were all lighted. Five parks had exercise equipment and all parks had grassed areas for informal play. The community pool complex contained the only basketball and lawn tennis courts in the community. They were equipped with lights. There were no cycle paths, netball courts, or indoor recreational facilities in the development. Play equipment for children existed only within two parks. Each possessed a see-saw, slide, and swing. One park had additional equipment such as climbing frame, hanging bars, monkey bars and roundabout. There were no play equipment for adolescents in any of the public open spaces.

Supporting amenities existed in all the public open spaces. There were pavilions in three, benches in six, and pipe-borne water supply and toilet facilities in three. Natural and manmade shaded areas were available in four public open spaces.

Discussion

The results from the audit at Diamond Vale Development are discussed in relation to the guidelines used by the State's planning agency. Requirements provided to developers prior to the initial development of Diamond Vale Development were unavailable. But two current guidelines regarding space allocation and provision of supporting amenities and safety measures were assessed. In an interview with one of the first residents, he revealed that initially public open spaces were allocated, but recreational facilities were not provided. Further, ball games were not permitted in the allocated open spaces (Kissoon 2016). The parks were developed and outfitted over time by State agencies.

The audit results showed recreational facilities for children and adolescents in the different neighborhoods in Diamond Vale Development. There were many opportunities for walking, with paths existing in all parks, and pavements constructed alongside each park. When pedestrian pathways are part of an open space network it is characteristic of active design, encouraged (City of New York 2010), and facilitated walking as physical exercise (Kellett and Rofe 2009). But, there were no dedicated, linked cycling access to the parks. Roadways may be used but this could be dangerous for children. Cycling paths were also not available within parks; robbing children and adolescents of valuable physical activity. Other activity-promoting facilities like basketball and tennis courts were limited to the pool complex located on the southern portion of the community. Children and adolescents risked crossing a major roadway to access these facilities; restricting walking access to these facilities for some. When youths have safe access to public open spaces (Healthy Active by Design 2014), through pavements leading to the open spaces, and within a short distance from their homes (City of New York 2010; Faizi, Hosseini and Maleki 2011), they may make greater use of recreational facilities. Exercise equipment which was installed in five parks provided more opportunities for physical exercise for adults.

Play equipment was only provided for children. They were found in play lots within two parks, but the equipment in one park was in poor condition. Children in four neighborhoods were deprived of play facilities and could not be expected to access the two play lots located on either side of the major roadway. Play equipment was needed within the six centrally located parks. Moreover, there was no play equipment suitable for adolescents. Some researchers have observed that planners ignored adolescents when providing play equipment at parks, and at times this was deliberate (Wood, Martin and Carter n.d.). They also reported that adolescents wanted appropriate challenging play equipment, which ultimately would promote their physical wellbeing.

The level of supporting amenities varied with each public open space. While, for instance, benches were provided in all but one, there were deficiencies in provision of pavilions, potable water supply, and toilet facilities. Although amenities do not directly contribute to physical activity in children and adolescents, they may attract them to visit the open spaces and make use of the activity-promoting facilities (Bedimo-Rung, Mowen and Cohen 2005).

Additionally, safety measures were implemented in Diamond Vale. Research has found that association between safety and promotion of physical activity has been inconsistent (Bedimo-Rung, Mowen and Cohen 2005). However, the central location of parks, their siting opposite to houses and streets, installation of lighting, and construction of fencing in four of the open spaces may facilitate safe use by children and adolescents. Three parks remained unfenced and may constitute a safety concern.

Greenvale Park and Trestrail Estate were also examined to assess the effectiveness of guidelines for public open spaces. Greenvale Park was approved in 2014 and when the application was submitted, the

houses and infrastructure were already in place. The plans showed allocations for public open space, landscaped areas, two parks, six play lots, and a recreation ground. Information about the type of recreational facilities, amenities, and play equipment as outlined in the guidelines, were not provided with the submission of the application. The obligation to construct the houses simultaneously with the development of open spaces, were rendered irrelevant. Guidelines were therefore overlooked and became ineffective in ensuring provision of required public open spaces. If the allocated spaces were inadequate or unsuited for recreation, there was little that could be done to secure alternative sites. Further, there was the risk of the allocated spaces remaining undeveloped or eventually converted into residential use.

Potentially, Trestrail Estate in D'Abadie may produce better results than at Greenvale Park. This application was the most recent approval of a state-developed settlement in the Capital Region. When final planning permission was granted the site was a green field site. The HDC received guidelines through the published Guide to Developers and Applicants for Planning Permission, through consultations with planning officers, and in the Outline Planning Permission which was granted. The plans showed public open space allocations but had limited activity-promoting facilities. There was no information on play equipment and further details were not given in documents submitted. Proposals for supporting amenities, and the simultaneous construction of houses and open spaces were not provided. However, Trestrail Estate still has great potential for the effective implementation of the planning guidelines.

Conclusions and Recommendations

The situation at Diamond Vale is not perfect, but shows that it is possible to provide activity-promoting open spaces in state-planned development. When relevant guidelines and requirements are applied by planning officers consistently, prior to approval; and if State developers comply, the guidelines have potential to produce required activity-promoting public open space. Further, the Trestrail Estate case shows that current efforts by the planning agency and the HDC are pointed in the direction of improvement, in the adherence to planning guidelines. Situations of almost total abandonment of the guidelines and required procedures, similar to Greenvale Park, cannot continue.

However, the audit revealed serious shortcomings in the public open spaces at Diamond Vale that points to needed intervention. Because of the importance of physical activity to the health of children and adolescents, immediate retrofitting of this state-developed neighborhood is required. Further, the planning agency should initiate discussions with the HDC and other relevant State agencies, aimed at conducting audits of all existing state-developed human settlements. This will be a time-consuming, costly, and difficult undertaking; but one that is required due to the dire consequences of non-action, and the continued lack of provision of appropriate activity-promoting facilities.

Also, the planning agency must engage in retooling and updating the information and skill-sets of officers. This is aimed at: (i) developing a better understanding of neighborhood design principles relating to the promotion of physical activity; (ii) creating a better understanding of the urban planner's responsibility in treating with public health matters; and (iii) helping to create sustainable human settlements that support healthy lifestyles (Ricklin and Kushner n.d.), and facilitate higher levels of physical activity (National Heart Foundation of Australia 2014) especially among children and adolescents.

Additionally, the spatial planning agency also needs to intervene by reviewing its guidelines to ensure they effectively meet the recreation needs of today's children and adolescents, and that they can be effectively implemented. These guidelines must be flexible and adaptable to changing environments within urban human settlements (Duhl and Sanchez 1999). They cannot however, be developed in isolation divorced from related socioeconomic, political, cultural or other considerations (Duhl and

Sanchez 1999). The Regional Corporation, the HDC, health professionals, and allied design professionals must be involved. This “all-of-society” and “all-of-government approach (Hospedales 2015, 93) has wide support (National Heart Foundation of Australia 2014) (World Health Organization 2013) The TCPD should initiate the required multi-sectoral, multi-level, and multi-stakeholder collaboration.

Specifically, the planning agency must strengthen and deepen the relationship between itself and local government authorities. This helps to ensure compliance with all legislative and regulatory requirements relating to provision of public open spaces, and facilitate actual provision and development of equipped public open spaces. This is important since local government operate at the level closest to the community, and has a critical role in the provision and maintenance of certain community facilities (National Heart Foundation of Australia 2014).

Overall, a paradigm shift in approach is needed by the planning agency and a community-based approach to planning is now required. This fosters genuine partnership with, and participation by community members. It ensures inclusive planning and a more consultative approach to determining standards and guidelines. The planning agency must therefore work with community members (World Health Organization 2011) to ensure human settlements are designed in ways that facilitate physical activity. It must particularly involve young people (Caribbean Public Health Agency 2015) to solicit unique approaches leading to improved health and wellbeing, in a manner that accord with the goal of sustainable development (Malhotra 2011). Neighborhood management of parks and other open spaces, while difficult to implement, should be encouraged. Public education is also required to allow the planning agency to simplify and clearly articulate planning policies, standards, and guidelines. This should help with compliance with planning procedures and guidelines.

When the State’s planning agency fail to effectively develop and implement its guidelines and procedures, they contribute to poorly-planned human settlements, which ultimately impacts public health. The State and its agencies, whether as regulators or developers, must take the lead in helping to achieve healthy and sustainable human settlements. This way they impact the built environment and by their intervention apply preventative medication, and help address the Caribbean epidemic of chronic NCDs among children and adolescents.

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