Grassroots projects aimed at the built environment: Association with neighbourhood deprivation, land-use mix and injury risk to road users

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ABSTRACT

OBJECTIVES: 1) To describe grassroots projects aimed at the built environment and associated with active transportation on the Island of Montreal; and 2) to examine associations between the number of projects and indicators of neighbourhood material and social deprivation and the built environment.

METHOD: We identified funding agencies and community groups conducting projects on built environments throughout the Island of Montreal. Through website consultation and a snowballing procedure, we inventoried projects that aimed at transforming built environments and that were carried out by community organizations between January 1, 2006, and November 1, 2010. We coded and validated information about project activities and created an interactive map using Geoclip software. Correlational analyses quantified associations between number of projects, neighbourhood characteristics and deprivation.

RESULTS: A total of 134 community organizations were identified, and 183 grassroots projects were inventoried. A large number of projects were aimed at increasing awareness of/improving active or public transportation (n=95), improving road safety (n=84) and enhancing neighbourhood beautification and greening (n=69). The correlation between the presence of projects and the extent of neighbourhood material deprivation was small (Kendall’s τ=0.26, p<0.001), but in areas with greater social deprivation there were more projects (Kendall’s τ=0.38, p<0.001). Larger numbers of projects were also associated with the presence of more extensive land-use mix (Kendall’s τ=0.23, p<0.001) and a greater proportion of road intersections with injured pedestrians, cyclists and motor vehicle users (Kendall’s τ=0.43, p<0.001).

CONCLUSION: There is significant community mobilization around built environments and active transportation. Investigations of the implementation processes and impacts are warranted.

KEY WORDS: Sustainable transportation; active transportation; community mobilization; built environment; material and social deprivation

There is growing evidence that over-reliance on motorized transportation modes has had negative health effects (e.g., obesity, sedentary living) and environmental consequences (e.g., air and noise pollution).1-3 Intervention efforts are underway to render built environments more conducive to active transportation (cycling and walking).4-6 Previous research shows that active transportation is supported by greater accessibility to services,7,10 availability of public transportation amenities and walking and cycling infrastructure,7,9,11,12 greater safety from traffic and crime,7,9,13,14 areas with more green cover, and the presence of natural environments (e.g., lakes, forests). Some research suggests that disadvantaged groups often live in environments that are less conducive to active transportation.15 Recognizing that built environments are constructed and transformed by urban planners, engineers and other municipal workers, much of the research has focused on how to mobilize these professionals.16,17 A growing body of research has focused on the role played by community groups and civil society, which exert pressures on policy-makers and elected officials to approve and financially support changes to the built environment enacted by urban planners and engineers.18-21 Specifically, evidence shows that collaboration between professionals and community groups is essential to changing environments and to maximizing health impacts.19-23

Special attention has been paid to the challenges involved in establishing partnerships and finding the best means of supporting community organizations, which most often experience limited and inconsistent funding.22,23 Despite the key

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role played by community groups in giving a voice to citizens, there is limited knowledge about how many community organizations have grassroots projects unfolding, what the targets of built environment change are and in which neighbourhoods projects are being implemented. This information is key to establishing partnerships and moving the agenda of transformation of built environments forward.

The purposes of this study were to 1) describe grassroots projects aimed at the built environment and associated with active transportation on the Island of Montreal, and 2) examine associations between the number of projects and indicators of neighbourhood material and social deprivation and the built environment.

METHOD

The current study was part of a larger initiative named Healthy Canada by Design, a Canadian coalition of health units, planning organizations and non-governmental organizations that came together to unite existing and emerging cross-sector efforts to promote healthy built environments by translating the latest research into state-of-the-art intervention tools.

Procedures for developing an inventory of grassroots projects

Agencies that awarded funds to community groups throughout the Island of Montreal to modify built environments were first identified. A list of agencies had been compiled as part of ongoing operations at the Montreal Public Health Department. Community groups were defined as organizations that contributed to the exercise of citizenship and were not-for-profit organizations, were rooted in the community, maintained the life of an association and were free to establish their mission, approaches, practices and orientations. These criteria included community organizations dealing with the environment and other local dialogue groups (like neighbourhood round tables or local revitalization committees), but they excluded religion-based organizations, foundations whose mission consisted essentially of collecting and redistributing funds, and organizations consisting only of volunteers.

Projects to be inventoried were retained on the basis of two inclusion criteria: 1) projects that unfolded between January 1, 2006 and November 1, 2010, and 2) projects aimed at promoting walking, physical activity or active transportation through intervention in built environments to support sustainable transportation through any of the following dimensions, known to be related to sustainable transportation: i) increasing accessibility to services and amenities (e.g., implementing public markets); ii) increasing awareness and improving amenities or infrastructure for public transit or active transportation (e.g., adding bicycle racks, elaborating transportation plans); iii) improving road safety (e.g., implementing traffic calming measures); iv) improving safety against crime (e.g., improving lighting and road signaling); v) beautification and greening of neighbourhoods (e.g., community gardens, green roof); and vi) protecting and promoting natural environments (e.g., waterfront, forests, nature conservatories).

Initially, information regarding projects was gathered through existing databases and archival information within ongoing activities of the Montreal Public Health Department. Funding agencies were also contacted to obtain information about the community groups and projects they had funded if this information was unavailable through web sites. This allowed for a snowballing procedure to occur whereby contacts identified projects that may not have been registered on web sites or that were funded by an agency that was not on original lists.

Once a list of projects had been identified, information about the activities and partners was extracted from project descriptions and documentation. This information was then coded to indicate the six dimensions, as already listed, of the built environment that the projects aimed to change. Coded information was sent to community groups for validation and corrections. Erroneous information was corrected.

Creation of a georeferenced inventory

All community organizations conducting projects were georeferenced with a software program called Geoclip (developed by emc3) using their street address and postal code. An interactive map with clickable dots for each community organization was created. Clicking called up a new window with fact sheets showing project titles, project duration, project promoters, dimensions of sustainable transportation aimed at through the project, project objectives, description of activities and territorial reach of the project, partners and funding support program.

Material and social deprivation, and built environment in areas where grassroots projects unfold

In order to determine the extent of material and social deprivation in areas where grassroots projects were occurring, we used the indices of material and social deprivation developed by Pampalon et al., which are widely used in Quebec as markers of social inequalities. Pampalon’s material deprivation index is a composite index that combines census data on education, employment and income, whereas the social deprivation index is a composite index combining family structure, marital status and living status (see references for further details on the validity of these indicators). Values were recoded into quintiles for purposes of analysis, more deprivation being expressed by higher quintiles.

### Table 1. Number and targets of grassroots projects that were active between January 1, 2006 and November 1, 2010 on the Island of Montreal

<table>
<thead>
<tr>
<th>Dimensions of the built environment associated with sustainable transportation that were targeted</th>
<th>Number of grassroots projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility to services and amenities (e.g., implementing public markets)</td>
<td>27</td>
</tr>
<tr>
<td>Increasing awareness of/improving active or public transportation options (e.g., adding bicycle racks, elaborating transportation plans)</td>
<td>95</td>
</tr>
<tr>
<td>Improving road safety (e.g., traffic calming measures, Pedibus)</td>
<td>84</td>
</tr>
<tr>
<td>Improving safety against crime (e.g., improving lighting and road signaling)</td>
<td>46</td>
</tr>
<tr>
<td>Beautification and greening of neighbourhoods (e.g., community garden, green roof)</td>
<td>69</td>
</tr>
<tr>
<td>Protecting and promoting natural environments (e.g., waterfront, forests, nature conservatories)</td>
<td>7</td>
</tr>
</tbody>
</table>
Since these indicators are census-based, indicators of material and social deprivation can be aggregated to different territorial units. Given our interest in the work of community groups involved in local grassroots projects, we used indicators of material and social deprivation at the level of neighbourhoods. The Montreal Public Health Department has adopted neighbourhood territorial divisions (n=111 neighbourhoods) based on census tract boundaries, physical or natural boundaries (e.g., railroad track, parks) and residents’ recognition and feeling of belonging to a neighbourhood. We used these territorial divisions to locate community groups into neighbourhoods, and we computed material and social deprivation for each of the neighbourhoods.

In addition, indicators of neighbourhood built environment were derived. Using data from the City’s property evaluation roll, land was categorized as either residential, high density residential mixed with commercial, institutional, commercial or industrial. A score was given to each type of land use, and then values were combined into a score ranging from 0 to 1 with higher scores indicating greater land-use mix in the neighbourhood. From accident report data from the uniformed ambulance service, the proportion of intersections in the neighbourhood that had been the site of an ambulance visit for an injured pedestrian, cyclist or motor vehicle user between 1999 and 2008 was calculated.

Statistical analyses

After having georeferenced each community group, we examined correlations (Kendall’s tau \( \tau \)) given the frequency count of number of projects) between the number of projects in each of the 111 neighbourhoods and the level of material and social deprivation of populations living in these neighbourhoods and built environment indicators.

RESULTS

We identified 134 community organizations throughout the Island of Montreal, which ran 183 grassroots projects aimed at transforming dimensions of built environments associated with sustainable transportation between January 1, 2006 and November 1, 2010. The locations of these community organizations were geocoded. Mapping is available on a web site (http://emis.santemontréal.qc.ca/outils/atlas-sante-montreal/ressources/les-ong-projets-en-environnement-bati-et-mobilite-durable/).

Table 1 shows that there were more projects involving the dimensions of increasing awareness or improving active or public transportation options and of improving road safety than other dimensions. Ten projects aimed to intervene in three or more targets, 107 projects in two targets and 64 projects in a single target. As depicted in Figure 1, projects were concentrated in the central, more urbanized areas of the Island of Montreal. Across the 111 neighbourhoods, a subgroup of 52 had no community groups running projects whereas 26, 15 and 17 neighbourhoods had respectively 1, 2 or 3 or more community groups leading grassroots projects.

Examination of correlations showed that there was a small and statistically significant association between the presence of projects and the extent of the material (Kendall’s \( \tau =0.26, p<0.001 \)) and social (Kendall’s \( \tau =0.38, p<0.001 \)) deprivation of local residents. To further illustrate the nature of the associations, we created box-plots of associations (see Figure 2). As can be seen, the association with material deprivation is modest whereas the association with social deprivation is stronger. As well, more projects were associated with the presence of more extensive land-use mix (Kendall’s \( \tau =0.23, p<0.001 \)) and with a greater proportion of intersections in the neighbourhood with injured pedestrians, cyclists or motor-vehicle users (Kendall’s \( \tau =0.43, p<0.001 \)).
DISCUSSION

The results of the inventory and mapping of grassroots projects on the Island of Montreal showed that a large number of projects (i.e., 183) aimed at transforming dimensions of the built environment associated with sustainable transportation were unfolding between January 1, 2006 and November 1, 2010. The largest number of projects targeted improvement of amenities or infrastructure for public transit or active transportation and improvements in safety against crime. Beautification and greening of environments, including community gardens, was also a frequently pursued target. These data indicate that community groups are quite active in attempting to change built environments.

We observed that there were more projects going on in areas where social deprivation, material deprivation, land-use mix and injury risks to road users were greater. The weaker association observed for material deprivation may be related to community action in these neighbourhoods being aimed at other priorities, such as housing or employment. The stronger association between number of projects and social deprivation may suggest an adaptive response of communities attempting to better an area where people are in greater need of community supports.

To our knowledge, this is the first attempt to produce an inventory of grassroots projects aimed at transforming built environments and to better understand community mobilization about active transportation in Montreal. The results of the study provide a visual, albeit descriptive, account of where community mobilization around this issue is located. This information is useful to policy-makers, who can more effectively plan built environment transformations around community needs and concerns. The fact that the presence of projects is associated with greater material and social deprivation also provides a better understanding of the context within which efforts to transform built environments occur.

The replication and extension of these findings in other Canadian cities seems warranted, as community groups often focus efforts on activities and projects that are most treasured by citizens. The implementation processes of this type of community mobilization are also of interest, as they may allow for the crafting of more effective financial and social supports of community groups as well as more sustainable partnerships.

Limitations

The study has several limitations. Efforts were made to identify all community groups and grassroots projects aimed at built environments and sustainable mobility. However, funding agencies and community organizations may have been too busy to thoroughly double-check all the information that was forwarded to them. It is possible that selected projects are missing from the inventory. However, this number is probably negligible since the snowballing procedure led to saturation.

Although we were able to geolocate the street address for the community groups, we were unable to precisely describe the territorial reach of projects and to depict this reach with the interactive software tool. Many projects had a diffuse territorial reach, and some projects simply did not compile this type of information. Further data collection methods need to be developed to ascertain these dimensions of projects. At a minimum, though, we were able to pinpoint the neighbourhoods in which projects unfolded.

Last, the data collected on community groups and their projects did not allow us to determine whether projects were initiated in response to community requests or priorities (bottom up), or whether they were initiated because of funding opportunities (top down). Further research is warranted to understand more about how projects emerge and why community groups decide to act on the chosen targets. More information on the effectiveness and complementarity of bottom-up and top-down approaches would also be a fruitful area for future research.

CONCLUSION

A large number of grassroots projects aim to improve dimensions of built environments associated with active transportation on the Island of Montreal. Projects were concentrated in more urbanized neighbourhoods where more socially isolated and
materially deprived people live and where a greater number of road intersections are the site of injuries. Future research on the impact of these projects on the built environment is needed, as community groups represent a voice for populations and a mechanism through which they can exercise citizenship.

REFERENCES