

## 1 **Abstract**

2 Physical inactivity among children is a significant public health concern. Active school travel  
3 (AST) methods, such as walking and wheeling to school, can be a valuable way to increase  
4 children's levels of daily physical activity. In Canada, Active and Safe Routes to School  
5 (ASRTS), a national health promotion initiative, has led the campaign for AST through its  
6 flagship School Travel Plan (STP) program. At present little is known about the on-the-ground  
7 implementation processes that impede or facilitate the success of STPs. Through a thematic  
8 analysis of 18 interviews with STP facilitators and 4 focus groups with the larger STP  
9 committees, our study evaluates the factors shaping the functioning of STP interventions at ten  
10 elementary schools participating in a regional ASRTS program in Southwestern Ontario. Our  
11 analysis yielded six themes that have implications for STP implementation and sustainability: 1)  
12 accounting for school context; 2) establishing committee capacity and leadership; 3) supporting  
13 STP action; 4) responsiveness to external and internal barriers; 5) engaging schools at the  
14 grassroots level; and 6) building future champions. We draw from Lewin's Field Theory and  
15 discuss the forces affecting STP committees to frame our findings in a way that can be discussed  
16 to support the building of efficient, effective, and viable AST intervention environments.

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23 *Keywords:* Canada; active school travel; children's health; Field Theory; organizational change;  
24 physical activity; school travel planning

## 25 **1 Introduction**

26 Engagement in physical activity (PA) has important physical (Larsen, Kristensen, Junge,  
27 Rexen, & Wedderkopp, 2015) and cognitive (Fedewa & Ahn, 2011) health benefits for children.  
28 However, 81 percent of adolescents (11-17 years old) worldwide are not attaining sufficient  
29 levels of PA (World Health Organization, 2018). Such low levels of PA are doubly concerning  
30 considering that habits developed during childhood can transfer into adulthood (Telama et al.,  
31 2005). Active school travel (AST), such as walking or cycling to/from school, has been  
32 suggested as a key method to improve PA opportunities for children (Sallis et al., 2006). With  
33 children under 13 years old spending 15% of all time during an average week in school (Hofferth  
34 & Sandberg, 2001), incorporating AST into daily routines has the potential to not only increase  
35 children's PA, but also contribute to their overall health by reducing harmful vehicular emissions  
36 in the school area (Bearman & Singleton, 2014).

37 Participation in AST has many potential benefits for children, including helping children  
38 achieve up to 30 percent of the recommended 60 minutes per day of moderate-to-vigorous PA  
39 (van Sluijs et al., 2009). Moreover, increases in children's AST have been associated with  
40 increased fitness levels (Lubans, Boreham, Kelly, & Foster, 2011), reduced perceived stress  
41 (Lambiase, Barry, & Roemmich, 2010), improved mental health (Fyhri & Hjorthol, 2009), and  
42 the generation of positive emotions (Ramanathan, O'Brien, Faulkner, & Stone, 2014). However,  
43 despite its many potential benefits, AST participation rates have declined internationally (Grize,  
44 Bringolf-Isler, Martin, & Braun-Fahrländer, 2010; McDonald, 2007; van der Ploeg, Merom,  
45 Corpuz, & Bauman, 2007). Thus, building regular engagement in AST represents an opportunity  
46 for public health practitioners and school communities to address children's physical inactivity.

47 Factors influencing AST participation are multiple and complex, including distance to  
48 school (Emond & Handy, 2012; Larsen et al., 2009; Larsen, Gilliland, & Hess, 2012), child age  
49 (Bere, van der Horst, Oenema, Prins, & Brug, 2008; Robertson-Wilson, Leatherdale, & Wong,  
50 2008), and gender (Evenson, Huston, McMillen, Bors, & Ward, 2003; Larsen et al., 2009). For  
51 instance, perceptions of traffic safety (Helbich et al., 2016) and social concerns around stranger  
52 danger (Panter, Jones, Sluijs, & Griffin, 2010) and bullying (Zwerts, Allaert, Janssens, Wets, &  
53 Witlox, 2010) influence children's rates of walking, while environmental variables, such as  
54 block density, signalized intersections (Mitra & Buliung, 2012) and street trees (Larsen et al.,  
55 2012) are linked to AST. With community-based organizations, policy-makers, and public health  
56 practitioners seeking ways to effectively address these multiple, intersecting influences on AST,  
57 a myriad of interventions have been implemented globally (Larouche, Mammen, Rowe, &  
58 Faulkner, 2018).

59 In Canada, Active and Safe Routes to School (ASRTS), a national health initiative  
60 developed by Green Communities Canada, adapted the school travel plan (STP) model from  
61 international best practices and started piloting AST programs in 2006 (Active and Safe Routes  
62 to School, 2018a). Central to the STP intervention are facilitators who play a pivotal role in  
63 promoting the program to the school community, establishing a larger STP committee of  
64 community partners (e.g., municipal officials, parents, police, principals, public health  
65 practitioners), and overseeing the development of a school-specific action plan (Active and Safe  
66 Routes to School, 2018b). STP action planning is comprised of five steps (see Figure 1).  
67 Broadly, STPs promote and raise awareness of AST through what ASRTS calls the five 'Es':  
68 education, encouragement, enforcement, engineering, and evaluation (Active and Safe Routes to  
69 School, 2018c).

70           **[Insert Figure 1 here]**

71           Effective AST interventions require cross-sector collaborations. Recent research suggests  
72 understanding how cross-sector partners perceive barriers and enablers to active travel assists in  
73 improving collaborative efforts (Cole, Burke, Leslie, Donald, & Owen, 2010). To our  
74 knowledge, however, only a few published studies have investigated the organizational dynamics  
75 of partnerships supporting AST interventions. Macridis and García Bengoechea (2015) provide  
76 an overview of different partnerships supporting AST programs and document how interventions  
77 are facilitated and operationalized. More pointedly, Mammen, Stone, Buliung, and Faulkner  
78 (2015) examined the perspectives of STP facilitators in the Canadian context and reported that  
79 collaboration, an organized model structure, and member involvement positively impacted  
80 implementation; subsequently, they called for future case studies to examine STPs in greater  
81 depth. Atteberry et al. (2016) and Cooper and McMillan (2010), meanwhile, examined the  
82 implementation of the Safe Routes To School program in the U.S. context, with the former, more  
83 recent paper recommending future work investigate the interactions of members within the  
84 partnerships and their implications for intervention implementation. Here, we present a detailed  
85 evaluation case study of the organizational features shaping the implementation and  
86 sustainability of an AST intervention (the STP model) from the perspectives of stakeholders  
87 involved, as well as a first attempt to understand AST intervention dynamics using  
88 organizational change theory. To guide this study, we asked: 1) How do STP structure,  
89 organization, and resources influence the implementation of the STP intervention? and 2) What  
90 features of the STP intervention influence its efficacy and sustainability?

## 91 **1.1 Theoretical Framework**

92 Our evaluation examines a fundamental health promotion issue regarding to what extent  
93 committees implementing STPs perceive the organizational dynamics and related processes of  
94 change to enable and/or constrain the effectiveness of the STP intervention. We draw on Kurt  
95 Lewin's Field Theory of organizational change because it offers a conceptual lens by which to  
96 analyze group (STP committee) behavior in a particular setting (STP intervention) (Lewin,  
97 1936). Broadly, Field Theory operates on the premise that behavior is a function of a group's  
98 environment or 'field', and by considering the environmental complexities and influence(s) we  
99 can understand observed behaviors (Lewin, 1936). The field, though, is time dependent and  
100 composed of several interdependent 'forces' (Lewin, 1943) that, in our case of the STP program,  
101 include internal group characteristics such as management, personnel, strategies, and structure,  
102 as well as external characteristics such as the school and surrounding communities. Force field  
103 analysis can subsequently be utilized to identify the specific forces that should be abated or  
104 fortified to facilitate a group's desired planned change (Lewin, 1998). Thus, with Field Theory  
105 and its force field analysis, we make sense of our findings by conceptualizing the environment of  
106 an STP committee and considering the relational dynamics among the forces constraining and  
107 facilitating its implementation and sustainability.

108 Organizational change approaches have been applied in a variety of health-related  
109 contexts, including health promoting hospitals (Lee, Chen, Powell, & Chu, 2014), public health  
110 planning (Thomas, Hodge, & Smith, 2009), and heart health promotion (Riley, Taylor, & Elliott,  
111 2003). Extending an organizational change approach to STP offers the opportunity to investigate  
112 how cross-sector partnerships define and respond to AST as a community-level issue, as well as  
113 what characteristics, personnel, and strategies participants deem most effective in and missing

114 from their programs. Given the research gap on the organizational dynamics of partnerships  
115 supporting AST, organizational change theory – specifically Field Theory – can allow us to  
116 examine and map a specific intervention environment and assess the infrastructure and capacity  
117 required to address its organizational challenges (Batras, Duff, & Smith, 2016). Ultimately, these  
118 insights will help generate evidence about best practices for STP intervention implementation  
119 and sustainability, which, in the long-run, has the potential to contribute to supporting children’s  
120 increased and sustained engagement in AST.

## 121 **2 Methods**

### 122 **2.1 Study Context**

123 This study draws from schools participating in the Elgin-St. Thomas-London-Middlesex-  
124 Oxford (ELMO) ASRTS program in Southwestern Ontario, Canada. The ELMO tri-county  
125 region is home to 655,366 people (Statistics Canada, 2016) and located approximately halfway  
126 between Toronto, Ontario and Detroit, Michigan. School commuting contexts were framed by  
127 varying degrees of urbanicity (high density city centres to low density rural areas) and school  
128 demographics (student populations <300 to >600). Three schools were located in urban areas,  
129 five in suburban locales, and two in rural townships.

### 130 **2.2 Sample and Recruitment**

131 We recruited a purposeful sample through the ELMO ASRTS program because our goal  
132 was to learn in-depth about the ASRTS program, and thus participants with high levels of  
133 involvement in the program were targeted. We focused only on schools in their STP evaluation  
134 phase in order to gather perspectives on the full implementation of the program. As of December  
135 2017, when data collection concluded, there were 21 elementary schools participating in the

136 ELMO ASRTS program, of which ten were in their evaluation phase. Within the region there are  
137 a variety of different built environments: one major city-center (London), three regional  
138 municipalities (St. Thomas, Strathroy, Woodstock), and several smaller rural communities.  
139 Representatives from all ten eligible schools accepted an invitation to participate in this study. At  
140 the time of our study, participants had recently completed their follow-up data collection (e.g.,  
141 surveys, traffic counts, walkabout) and were engaging in knowledge dissemination activities at  
142 their schools (e.g., presentations of school results, building summative school feedback reports).  
143 Our qualitative evaluation component complements these STP activities by focusing in-depth on  
144 insider perspectives of committee functioning and sustainability.

145 Eligibility criteria included that participants must: (1) have made a significant time  
146 commitment to, or helped in the planning of, their STP, (2) have working knowledge of the  
147 entire STP process, and (3) be able to thoroughly discuss their respective school's STP  
148 initiatives. Only key facilitators (public health nurses [PHNs] and principals) were invited to  
149 participate in the interviews as they were responsible for overseeing the entire implementation of  
150 their STP and could best speak to the specific details of the program. We selected an interview  
151 format to allow these individuals to deeply and critically reflect on their STP experiences  
152 (Dowling, Lloyd, & Suchet-Pearson, 2016). Invitations for the focus groups, meanwhile, were  
153 extended to all STP committee members deemed to be the most involved by their respective  
154 facilitator. Focus groups provided a way to engage with potentially disparate views within the  
155 groups (Owen, 2001), as well as facilitate a group dynamic that fostered the emergence of new  
156 ideas (Sim, 1998)—both of which are important given our intention to understand the intra-  
157 organizational functioning of STP committees. Our participants comprised 33 individuals: 12

158 PHNs, seven principals, one vice-principal, two teachers, seven parent representatives, one  
159 community partner, and three city/town representatives.

### 160 **2.3 Data Collection**

161 All ten participating schools had at least one facilitator interviewed either in-person (n=3)  
162 or over the phone (n=15), while five of the ten participating schools were represented in the  
163 focus group discussions held on-site at schools. Both interviews and focus groups followed a  
164 semi-structured script to guide the discussion along the chronology of the STP intervention (see  
165 STP process depicted in Figure 1). This format allowed a degree of comparability, while still  
166 offering flexibility for participants to raise issues most important to them (Axinn & Pearce,  
167 2006).

168 Eighteen of 19 potential interviewees accepted to participate. Interviews were conducted  
169 by the lead author and ranged from 27 minutes to 1 hour and 14 minutes in length (average  
170 approximately 45 minutes). Of the sixteen interviews with facilitators, three were conducted with  
171 two PHNs present as in these cases the facilitator received substantial support from a second  
172 PHN and it was suggested they also participate. Additionally, we undertook one-on-one  
173 interviews with two municipal representatives who were STP committee members; one due to  
174 their school being unable to conduct a focus group, while the other had experiences with several  
175 STPs which positioned them to provide a level of insight that could be more fully explored in an  
176 interview than group setting.

177 Four focus groups were organized and moderated by the lead author with the assistance  
178 of a second interviewer, a program representative, who also asked questions. We agreed to have  
179 a program representative as the second interviewer to ensure credibility and buy-in for the



180 evaluation. Committee members were recruited to focus groups by their STP facilitator(s). All  
181 focus groups were approximately one hour in duration, with the longest being 70 minutes. To  
182 capture the school-level experience, each focus group consisted of four to eight school-specific  
183 STP committee members. On the recommendation of the facilitators, one focus group combined  
184 STPs from two schools due to their close geographic proximity and having frequently  
185 collaborated throughout the STP process.

186 All interviews and focus groups were audio recorded and transcribed verbatim by the  
187 lead author. Data were collected from October 2016 through December 2017 coinciding with the  
188 final schools from the initial STP program rollout having begun their evaluation phase. We  
189 altered any revealing information in quotations and used codes indicating committee member  
190 role to locate quotes (CP=Community Partner, CTR=City/Town Rep., PA=Parent, PR=Principal  
191 and PHN=Public Health Nurse, T=Teacher). This study was approved by the Non-Medical  
192 Research Ethics Board of the University of [omitted for review] (NM-REB #: 105635).

## 193 **2.4 Data Analysis**

194 We utilized Braun and Clarke's (2006) thematic analysis process in which we began by  
195 deductively coding each transcript, of both interviews and focus groups, allocating large  
196 segments of text into five categories that corresponded with the outcomes of interest: (1)  
197 organization, (2) resources, (3) structure, (4) efficacy, and (5) sustainability. Next, we  
198 inductively coded within these deductive categories to identify recurrent ideas. We followed an  
199 iterative and systematic process whereby the definitions of codes were refined, merged, and  
200 separated as needed, ultimately resulting in the generation of 30 robust codes with clear and  
201 discrete definitions. Next, we developed an intermediate set of concepts from these codes and  
202 engaged in another iterative process wherein we visually mapped the relationships between

203 concepts in order to create our final themes (n=6) and show that each contains contrasting forces  
204 to navigate (see Figure 2, “+” = facilitating force, “-” = constraining force).

205 **[Insert Figure 2 here]**

206 We employed several techniques to ensure rigour in our analysis. First, team members  
207 (A.B. and S.E.C.) critically discussed their differing interpretative possibilities of the findings at  
208 key points in the analysis, employing what Smith and McGannon (2017) describe as a practice of  
209 ‘critical friends’. As an additional part of the ‘critical friends’ technique, on three separate  
210 occasions, a note taker was present during phone interviews to provide analytic feedback to the  
211 interviewer and engage in a hermeneutic discussion regarding the important topics covered.  
212 Next, the lead author engaged in reflexive processes to document, identify, and challenge the  
213 constructions of knowledge that they interpreted in the findings (Cowan & Taylor, 2016),  
214 including writing and maintaining detailed reflexive notes to critically consider researcher  
215 positionality, as well as evaluating the note taker’s feedback to track new, emerging ideas and  
216 concepts. Last, to strengthen the ‘confirmability’ of the results, an audit trail was also maintained  
217 throughout the process of the study to track how and why various decisions were made (Baxter  
218 & Eyles, 1997).

### 219 **3 Findings**

220 Our findings discuss the range of forces and relational dynamics that shape an STP’s  
221 environment and viability from insiders’ perspectives, as well as point to crucial considerations  
222 for best practices in developing and implementing an effective STP. Below, our findings are  
223 organized according to six themes divided across two central levels of the STP model:

224 implementation and sustainability. As illustrated in Figure 2, within each theme are results  
225 reflecting both facilitating and constraining forces within an STP environment.

### 226 **3.1 Implementation**

#### 227 **3.1.1 Accounting for School Context**

228 Our participants stressed the importance of conducting a thorough evaluation of school  
229 context during the initial STP set-up phase. Participants frequently cited assessing school context  
230 prior to STP introduction as necessary for identifying school readiness and buy-in. As one  
231 facilitator explained, ensuring readiness to build a viable committee and obtain support from  
232 administration is critical for long-term prospects:

233 I think that really having school buy-in and having an STP committee that has your  
234 parents on it, a teacher, and the school principal or VP on it, I think that's what you need.  
235 If you don't have that, I don't know if school travel planning will be as successful and as  
236 sustainable [...] I think that, even as a facilitator, we come and go at schools [...] if the  
237 principal changes, you still have that core group that is still there and still passionate  
238 about it. (PHN2)

239 Other facilitators echoed this, contending that schools exhibiting initiative to support AST in  
240 their set-up phase were those that developed STP committees with a diverse spectrum of  
241 committed members.

242 Several STP facilitators also noted the importance of precisely locating the motivation for  
243 the STP program in the context of school priorities. Deciphering whether a school's initiative to  
244 participate in the STP program was internally driven (motivation comes from administration)  
245 versus externally driven (PHN drives the program) were interpreted as important forces affecting  
246 STP functioning. A few participants who felt a weak relationship with their school and that their  
247 STP was externally driven by a facilitator from outside the school administration elaborated that

248 the resulting program milieu invited complacency and overreliance on the facilitator. As one  
249 PHN explained, this culminated in straining the sustainability of their STP:

250 I feel that unless the PHN keeps supporting the school with all of the promotional items, I  
251 don't think much will happen at the school with the STP process. I think it has got to be  
252 driven by the PHN for this particular school [...] The nurse makes the announcements,  
253 writes the newsletter, and gets it out to the school [...] without a super engaged nurse  
254 leading that, I don't believe that the school, with their current administration, would do it  
255 independently. (PHN12)

256 When postulating ways to avoid such situations, a few facilitators expressed that identifying and  
257 subsequently building relationships between the STP committee and a school's "passion"  
258 (PHN7) (e.g., physical activity) could allow for the program to merge with an issue already  
259 carrying weight within a school administration, thus helping to internalize motivation for AST.

### 260 **3.1.2 Establishing Committee Capacity and Leadership**

261 Participants highlighted the intense capacity demands placed on facilitators as a  
262 constraining force. Facilitators, in particular, regularly relayed that heading an STP committee  
263 and organizing an STP action plan was "a huge learning process" (PHN5) and "an education  
264 piece" (PHN6), and often emphasized the substantial time commitment required of coordination  
265 tasks. Among many other duties, critical tasks included: balancing competing priorities within  
266 the committee, delegating assignments appropriately, and facilitating committee communication.  
267 Facilitators painted a picture of the weighty totality of their tasks, with one PHN explaining how  
268 the practical realities add up:

269 They [the facilitator] do all the behind the scenes work of taking information from the  
270 parent surveys, traffic counts, and designing the walkabout [...] the actual making of it  
271 [the action plan] into something readable and tangible is the STP facilitator [...] If they  
272 weren't there, that action plan would never actually be something to look at. (PHN4)

273 Overall, the demands of the facilitator role was acknowledged to be one of the greatest  
274 challenges and potential liabilities for program success.

275 Participants also drew attention to the importance of leadership quality in developing a  
276 well-functioning STP committee, with an ideal leader seen as possessing genuine enthusiasm and  
277 drive. One facilitator, who helped support multiple STPs, encapsulated this perspective when  
278 they explained how leadership character is a fundamental force for the success of the STP  
279 process:

280 [Who the] facilitator is, can, in my experience, make or break the success of the school  
281 travel plan. I think it is very important that they believe in the program. If it is just kind of  
282 a thing that they have to do – as in that is what the school has asked for and they are in  
283 that role – I don't find that it is nearly as successful as someone who really believes in the  
284 program, gets it, is passionate about it, and drives it and makes it happen. (PHN4)

285 Further supporting this notion were comments from participants who sensed their STPs lacked  
286 leadership or strong relationships between the facilitator and larger committee, resulting in poor  
287 organization and low program efficacy that ultimately hampered their program's efforts.

288 Like facilitators, many members of the larger STP committees posited that their roles  
289 benefited from clear definitions and expectations. There was consensus among committee  
290 members that having a defined role was essential to effectively contribute to their STPs and for  
291 the overall STP functioning. For example, one teacher's struggles to contribute to their STP  
292 stemmed from a lack of clarity regarding their specific role, as they explained "sometimes it can  
293 be overwhelming when you're looking at the big picture. That's how it was when I started,  
294 because I was trying to do it all and I couldn't, so I just felt defeated. But this year was like,  
295 'Hey, I did 'Winter Walk Day' and it was cool. I did another promotion day [...] it was  
296 awesome'" (T2). By choosing to participate in specific events, this participant was able to carve

297 out a discrete role that allowed them to strategically focus their efforts and contribute in what  
298 they viewed as an effective manner. It was ultimately suggested that clearly defining roles and  
299 expectations at the beginning of an STP, especially to establish the expected contributions of  
300 each committee member, is important in building an enterprising STP environment.

### 301 **3.1.3 Supporting STP Action**

302 When deliberating on committee characteristics and methods that best support the  
303 implementation of STP action plans, participants often spoke of the role of key personnel. On the  
304 one hand, public health unit supports (e.g., second PHN), parents, city/town representatives, a  
305 research partner, and community organizations (e.g., cycling skills organization) were frequently  
306 singled out. However, municipal representatives were especially valued as crucial facilitating  
307 forces for bringing AST issues to high level decision makers and pushing to create changes:

308 With our committee we had councilors and transportation people. We had a lot of  
309 infrastructure stuff done on behalf of this committee; we had a sidewalk outside the  
310 school [upgraded] [...] We had city councilors come out and look at the snow removal  
311 [...] [they created] the plans to make a priority for snow removal in school areas. (PHN3)

312 Conversely, there were several desired partners who were reportedly absent. Participants  
313 identified schoolboard facilities representatives and trustees, busing consortium representatives,  
314 students, and local neighborhood residents as additionally needed partners, principally because  
315 they were seen as having the ability to open up more avenues to affect change and support a  
316 wider array of action items.

317 One of the most important facilitating forces for success in action plan implementation  
318 our participants identified was the need for committees to establish an effective operational  
319 framework. Specifically, establishing a schedule of focused meetings was seen as crucial for  
320 attaining committee goals. Participants articulated that, ideally, issue-specific “ad hoc

321 subcommittee[s]” (PR4) that would meet only for select issues are useful to improve overall  
322 efficiency. This was seen to limit the demands placed on committee members by only requiring  
323 them to attend their relevant meetings, thereby allowing each member to place attention on the  
324 action items pertinent to them rather than the entire action plan. Speaking about their efforts to  
325 promote AST education, one community representative emphasized how this schedule allowed  
326 them to focus their efforts “to get out and educate the community on some of the various traffic  
327 concerns and issues [...] [and] to engage people” on AST topics (CTR1). While it may seem  
328 mundane, the meeting schedule was said to be a key force in helping to build an environment  
329 that maximizes (or undermines) the efficiency and organization of STP committees.

330         When speaking about action plan implementation, participants also expressed extensive  
331 support for utilizing a collaborative approach that leverages committee expertise and facilitates  
332 the building of responsible but supportive intra-committee relationships. For instance, one  
333 facilitator directly credited the success of their STP to their committee’s approach, explaining  
334 that it was highly beneficial to have the diversity of community partners “because you have so  
335 many experts. It wasn’t just one person that knew everything, but it was basically acknowledging  
336 that everyone had important information to share, they had different opinions” (PHN1). A parent  
337 added that this also helps to ensure responsibility and direction among the committee,  
338 commenting that they “liked having the diverse group – you got input from so many people [...]”  
339 Like it’s laid out so everybody knows their piece. I like that you can follow up and then meet  
340 again and say, ‘Okay what are the next steps? Who’s doing what? Where’s the next project?’”  
341 (PA3). A collaborative approach was seen as a unifying force in the program.

342         Participants also cited the importance of how committees situated their intentions  
343 underpinning STP action items. Going back to the five ‘Es’ of ASRTS, participants largely

344 viewed the rationales behind education, encouragement, and enforcement action items as  
345 supportive of their STP goals and appropriately implemented; however, engineering actions were  
346 more controversial. This was due to a common misconception that the visibility of infrastructure  
347 modifications was positively correlated with AST behaviour and perception changes, which  
348 could create unrealistic program expectations. One city representative described this conflict  
349 between community perceptions and engineering realities:

350         Engineers are told not to use all-way stops because signage doesn't necessarily slow  
351         down speed. The perception is that you have got speeding, but from where the signs are  
352         warranted they [the drivers] actually travel faster mid-block to make up time. [This was  
353         indicated] and then there was a comment about speed bumps. Again, you can put speed  
354         bumps in but it will displace the people that want to [speed]. If the city is set up in a grid  
355         pattern, it will displace the speed to other streets. So I don't know if that will resolve the  
356         issue. (CTR3)

357 Other municipal representatives reiterated the importance of AST education, and concluded that  
358 supporting or advocating engineering action items cannot be viewed as a blanket solution for  
359 AST issues as it could foster the development of future constraining forces (e.g., false  
360 perceptions).

## 361 **3.2 Sustainability**

### 362 **3.2.1 Responsiveness to External and Internal Barriers**

363         Our investigation into STP sustainability found that timely navigation of both external  
364         and internal barriers is a crucial force for a functional STP committee environment. The greatest  
365         external barriers cited by committee members were parent-related, especially misgivings about  
366         the capacity of the STP program to change parental attitudes. An illuminating example of this  
367         was captured in one participant's experience enforcing illegal parking, during which they noted  
368         having parents "react very badly to me" (CP1) and the principal receiving complaints despite  
369         their STP focusing heavily on parental education. Tensions related to parental support for the



370 STP was a consistent concern raised by our participants, with one PHN plainly explaining  
371 “behavior and attitudes are still very poor in the parking lot, people are still parking in the  
372 handicap parking, you know the designated parking spots [...] parents are still sitting there [on  
373 the side of the street] waiting for the kids – there still is lots of work that needs to be done”  
374 (PHN6). Ensuring timely responses to these documented issues and increasing parental  
375 education, especially early on in an STP, were suggested by participants as potential future  
376 remedies.

377         When focusing inwardly on the committees themselves, participants identified the  
378 greatest internal barrier, or constraining force, as facilitator turnover, primarily due to the  
379 logistical issues that ensued. Consequences of turnover were swift and ruinous, and could result  
380 in the STP plan being “put to a halt more or less” (PHN3), as happened in one case where both a  
381 principal and vice principal left a school at a critical point in the STP action plan. Several others’  
382 accounts confirmed that the time, resources, and education commitment to get a new facilitator  
383 up-to-speed was a daunting task to achieve mid-STP. Buy-in also resurfaced as an internal  
384 barrier as participants contended that poor committee buy-in resulted in apathy towards AST,  
385 low attendance at meetings, and a sense of the program as a formality or ‘window-dressing’  
386 without real tangible outcomes. Ensuring buy-in and properly assessing a school’s initiative re-  
387 emerged here as crucial forces to assist in weathering a major loss, or guarding against member  
388 apathy.

### 389 **3.2.2 Engaging Schools at the Grassroots Level**

390         Participants emphasized the importance of taking a ‘bottom-’ or ‘ground-up’ approach to  
391 maximize STP sustainability. The STP model of building a program around school-specific  
392 concerns and targets, rather than following a ‘top-down’ structure with scripted strategies, was

393 favored by many participants as a way to maximize program efficiency. Participants reasoned  
394 this approach was conducive to developing crucial ‘inside champions’ (e.g., principal or teacher)  
395 who, as one PHN reflected, helped set a strong precedent for STP sustainability by leveraging  
396 their relationships: “the principal, they are the gatekeeper. They identified a readiness and  
397 basically just highlighted the importance of the [program to] staff. That point – if it [the STP] is  
398 something that the principal is encouraging – the staff often, in my experience, will support what  
399 they [the principal] do” (PHN1). Champions were also viewed as a key facilitating force in  
400 pushing a more proactive STP mindset at their schools.

401 Another important grassroots characteristic for many participants was the data collection  
402 processes, particularly at baseline data collection in the STP set-up phase where participants  
403 identified valuable opportunities to build engagement within STP committees. Walkabouts, in  
404 particular, were reported as an experience that exposed members to the complexities of AST, and  
405 where the issues “came alive” (PHN2). One facilitator explained that this exposure helps to get  
406 “all those community partners – the parents, the school, everybody – together and see [the  
407 concerns], that’s where the ball really starts to get rolling in the action plan [...] that to me  
408 engages everybody” (PHN2). One parent representative expanded on this notion adding to it the  
409 educational value of the walkabouts:

410 When we did the walkabout we were chatting with the city representative about traffic  
411 light safety and about pressing the button, and there were things I learned [...] That  
412 education that I received, it was like, ‘Okay well there is obviously other people that  
413 don’t know this’ [...] I thought that was a strength because we learn something and then  
414 you learn what other people maybe should be knowing as well. (PA1)

415 Traffic counts, however, were much more contentious. Some participants believed that the traffic  
416 counts helped bring visibility to the program at their school, noting experiences of onlookers

417 being inquisitive and supportive. Others struggled to see a greater purpose and detailed how  
418 community members were not happy with the observations and questioned their motives.

419 Long-term, participants also felt the grassroots approach was preferable because many  
420 claimed that, upon the completion of their STPs, AST was an issue requiring a genuine culture  
421 change. The concept of culture change, in its essence, was articulated as a matter of first  
422 increasing awareness about the complexity and timeline of AST issues, and then building a  
423 school-wide perspective that emphasizes patience. A city representative, using their committee  
424 as a small-scale example, argued that a bottom-up approach facilitated community connections  
425 with parents which helped build a realistic perspective of AST:

426 There is a high degree of appreciation I feel from the parents that participate in the whole  
427 thing. They realize that there has been a solid effort put forward to try and make it work  
428 [...] It's been that way the past 25-30 years where everybody is driving their kid to school  
429 – it is not an easy task to take on and try and reverse that trend. (CTR1)

430 In hindsight, many participants acknowledged changing culture and perspectives represented  
431 potentially the greatest constraining force to building support for AST at their schools, primarily  
432 because of the social norms and perspectives that come with living in an auto-oriented society.

### 433 **3.2.3 Building Future Champions**

434 Building program champions was a central idea in our participants' views on developing  
435 sustainability with respect to an STP environment. Participants proffered two important functions  
436 for such individuals: being a proactive supporter of AST issues in their community, and a  
437 recruiter who identifies new members “who are doers” (PA4). To the former, many participants  
438 suggested that building more proactive proponents of AST may be a key force for improving  
439 buy-in, developing a clearer sense of direction or purpose for the STP, and advertising the  
440 program to schools. Recruiting ‘doers’ was commonly mentioned as a method to help drive

441 change, with one principal elaborating that encouraging active involvement and building  
442 supportive parent-school relationships is a desirable characteristic for committee members:

443 It is about [...] the doing versus the volunteering. So we might not have as many  
444 volunteers as we would like for some of the things [...] but when we built it the parents  
445 participated. They saw the value in the walking school bus, they were going to participate  
446 you could see it. They have seen the value in the work that we have done in the traffic,  
447 and they [...] are participating. (PR5)

448 To support the development of champions, participants made clear that cultivating ‘doers’  
449 through showcasing meaningful changes could also be a future best practice.

## 450 **4 Discussion**

451 Collectively, our findings surface a number of STP best practices regarding program  
452 implementation and sustainability that can inform public health efforts supporting AST  
453 interventions. We return to Lewin’s Field Theory of organizational change to ground our  
454 suggestions for improving STP, and more broadly AST, intervention environments in our  
455 discussion below. To illustrate the implications of our findings, we adapted Burnes and Cooke’s  
456 (2013) Lewinian life space model and topologically mapped our discussion of the STP  
457 committee environment, including the facilitating and constraining forces, in relation to Field  
458 Theory (see Figure 3).

459 **[Insert Figure 3 here]**

### 460 **4.1 AST Intervention Environments: Significant Forces Affecting Implementation**

461 First, our study demonstrates the importance of the set-up phase in overall program  
462 functioning. Similar to other interventions which reported incorporating AST within a larger  
463 community project, such as community activity promotions (TenBrink, McMunn, & Panken,  
464 2009), our study likewise indicates that the level at which the mechanism for change originates,

465 top-down versus bottom-up, is significant for its long-term success. Although a review by  
466 Macridis and García Bengoechea (2015) found that both bottom-up and top-down approaches  
467 have been previously employed in AST interventions to varying degrees of success, our findings  
468 firmly support utilizing the bottom-up approach. In particular, our findings confirm what the  
469 existing literature shows about this approach as advantageous for the mobilization of partners  
470 and resources in AST (Geraghty et al., 2009; Henderson et al., 2013).

471         The important forces to focus on and strengthen in the nascent stages of an AST  
472 intervention, from a Field Theory perspective, are thus those that create an ‘active school  
473 environment’, specifically school readiness and buy-in. Assessments of school motivation,  
474 prospective committee viability and diversity, and the potential to merge AST with a school’s  
475 existing priorities are all important characteristics to consider and identify prior to program  
476 implementation. For example, if a school community exhibits a low level of internal motivation  
477 to help facilitate and support a program, preferring to be an ancillary player, we would suggest  
478 such an environment is passive and lacks the critical characteristics of a competent program.  
479 Instead, to cultivate an ‘active school environment’, future interventions should focus their initial  
480 efforts on expanding recruitment activities to community members not typically represented on  
481 STP committees (e.g., local residents and schoolboard representatives), find ways to engage  
482 parents in their program, and assess school priorities to see if AST can be incorporated into  
483 existing initiatives.

484         Regarding the implementation of AST programs, our study corroborates the importance  
485 of leadership and building strong intra-committee relationships. Weigand’s (2008) review of  
486 AST literature initially noted the importance and influence that leaders, such as local government  
487 and school facilitators, have in future intervention implementation and monitoring, and our

488 findings suggest analogous ideas. In fact, our findings go a step further and indicate that  
489 leadership can be instrumental in helping to establish a program precedent. However, our study  
490 also points to the implications of weak leadership. Recent research has reported issues such as  
491 missing partners (Heinrich, Aki, Hansen-Smith, Fenton, & Maddock, 2011) and community  
492 resistance (Deehr & Shumann, 2009) to AST interventions. In our evaluation, these issues were  
493 mentioned alongside instances of tenuous leadership and weak relationships. Given our results  
494 around the intensity of facilitator capacity demands, our research, like others (e.g., Hendy &  
495 Barlow, 2012), highlights the relationship between adverse conditions and leadership outcomes,  
496 specifically in relation to successful program implementation.

497         With collaboration being suggested to be a positive force in addressing AST issues  
498 (Mammen et al., 2015), and Field Theory similarly noting the centrality of ‘group dynamics’  
499 with respect to change (Burnes, 2004), we suggest that partnerships prioritize forces that promote  
500 cross-sector approaches, the development of a robust operational framework, and intra-  
501 committee relationship building during implementation. These priorities can help to foster an  
502 environment for partnerships that reduces facilitator capacity demands, thereby limiting potential  
503 liabilities (e.g., poor communication, organization). Our *supporting STP action* theme  
504 spotlighted group-based strategies, like clearly defining the roles and expectations for all  
505 committee members and developing a focused meeting schedule with issue-specific  
506 subcommittees, which could potentially be effective in this respect. Additionally, we advocate  
507 that future partnerships build several opportunities into their frameworks for AST education to  
508 address perception barriers. Walkabouts, for example, were widely supported for their ability to  
509 spur the engagement and education of individuals in the school community during the STP  
510 process. Engagement has been cited as an important aspect in AST partnerships (Kennedy &

511 Mammen, 2017), and by building a partnership schedule or framework with more opportunities  
512 for engagement, we contend that this can also serve as a viable method to allow for community  
513 partners to educate each other and parents on AST, as well as build supportive relationships  
514 within the committee that help can help protect against barriers such as apathy.

515 Another important force in program implementation is operational barriers. Parental  
516 behaviors such as unsafe parking (Hinckson, 2016), attitudes concerning social support (Panter et  
517 al., 2010), and perceptions of neighborhood safety (Carver, Timperio, & Crawford, 2008) are  
518 noted AST concerns shared by our participants. We posit these issues also act as external barriers  
519 in relation to AST partnerships during intervention implementation. While other research may  
520 advocate that engineering strategies are best to support AST (Ewing & Dumbaugh, 2009), our  
521 results suggest a broader sweeping program to creating an environment more conducive to  
522 minimizing such barriers, specifically highlighting the potential of using a bottom-up, grassroots  
523 approach. As our findings indicate, the bottom-up approach may help motivate partnerships to  
524 spotlight local AST issues and drive the production of AST champions who can prioritize  
525 whatever initiatives (e.g., crosswalks to improve walkability) are most pertinent to their school.  
526 Like Mammen et al. (2015), we found that champions were seen as critical to supporting AST  
527 for their ability to help develop program direction, recruit new members, and improve buy-in.  
528 With a wider and more passionate group supporting AST, future partnerships may have more  
529 reach in promoting the importance of AST as a worthy cause and changing parental concerns and  
530 perceptions.

531 An important facilitating force for AST partnerships to further explore, as pointed to by  
532 its near absence in our findings, is the role of students. Lacking student involvement is not new  
533 (e.g., Henderson et al., 2013); however, our participants did not identify a lack of student

534 perspectives in the program as a barrier, but rather just a missing element. As per Field Theory's  
535 notion of mediating forces, this might represent a potentially critical new characteristic that  
536 partnerships could consider engaging to help increase their reach. Students may hold the  
537 potential to more effectively invoke pressure upwardly on parents and laterally on their peers to  
538 adopt AST behaviours. Importantly, the student-student relationship has been found to have a  
539 significant impact on motivation in other settings, such as academic goal pursuit (Wentzel,  
540 Battle, Russell, & Looney, 2010). The potential of this relationship dynamic to be translated to  
541 AST in order to improve student motivations, as well as to better understand their perspectives  
542 on effective programming, should be explored. Incorporating students and, if possible,  
543 generating student AST champions may be another method by which partnerships can extend  
544 their reach.

#### 545 **4.2 AST Intervention Environments: Forces to Improve Sustainability**

546 Our findings indicate that intervention sustainability has much to do with perceptions and  
547 social norms. Like the Atteberry et al. (2016) and Mammen et al. (2015) studies, participants  
548 reported positive feelings regarding program efficacy; however, our participants were aware that  
549 societal perceptions had an important, adverse role in the larger AST participation discussion.  
550 The influence of an auto-oriented culture on travel mode decisions has been previously  
551 documented (Martinez, Ayala, Arredondo, Finch, & Elder, 2008), and many of our participants  
552 noted that the long-term nature of AST made it an issue that was difficult to properly address and  
553 convey to their communities. With a more thorough understanding of the scope and complexity  
554 of the issue, AST partnerships would benefit from framing AST as likely a slow process that  
555 needs to be facilitated by experienced change agents on STP committees.



556 Here it is important to consider that Lewin (1947) described the nature of change in Field  
557 Theory as ephemeral, suggesting that after a change (i.e., the intervention) it is not long until  
558 group behavior returns to its previous state. Therefore, based on the proactive sentiments  
559 documented in our findings, we offer two broader suggestions for future partnerships to guard  
560 against regressive behaviors. First, partnerships should prioritize efforts to foster a high level of  
561 communication with parents. If partnerships establish, early on, a proactive agenda to inform  
562 parents about the benefits and safety of AST, they may pre-empt negative parent perceptions and  
563 skepticism. Second, it is desirable to clearly establish the ownership of an AST intervention from  
564 inception. Having discernable ownership of the intervention within the STP committee, ideally  
565 by parents or champions, may help to establish an explicit mission for the program (e.g.,  
566 advocacy, educational). A clear directive may also assist in focusing strategies on which  
567 community partners to recruit, resources to acquire, and methods to prioritize to effectively  
568 engage school communities.

### 569 **4.3 Limitations**

570 There are a few limitations to our study. This study investigated an AST intervention  
571 model that was primarily implemented in higher socioeconomic status (SES) neighborhoods. In  
572 only one instance did facilitators define their school as high-needs or high-risk, thus  
573 considerations and insights regarding potential equity issues are limited. We engaged a diversity  
574 of perspectives, but were only able to include a few municipal and community organization (e.g.,  
575 non-profits) representatives as one non-profit organization closed and several other individuals  
576 had moved on to other roles. Consequently, while this study aimed to achieve a high level of  
577 rigour in its methods, an important implication to note here is that aspects of the organizational  
578 culture discussed in this study may be specific to the Canadian context. This must be taken into

579 account in terms of the generalizability of our findings to other cultural contexts which may  
580 include different stakeholders.

## 581 **5 Conclusion**

582 To our knowledge, this is the first in-depth case study regarding the organizational  
583 dynamics of a regional partnership supporting AST via STP, as well as the first attempt to frame  
584 STP dynamics by drawing on an organizational change theory. The six themes we identified in  
585 our analysis demonstrate that STP success is underpinned by a diversity of factors that range in  
586 scope from operational (e.g., meeting structure) to cultural (e.g., buy-in). This makes clear that in  
587 conceptualizing a plan for STP success, it is just as important that seemingly mundane aspects of  
588 committee operations be given just as serious consideration as is taking into account the  
589 specificities and needs of the local school context. Based on these findings, we suggest that  
590 public health and community interventions aimed to support AST should i) emphasize the  
591 importance of thorough pre-implementation assessments and build ‘active school environments’,  
592 and ii) foster the development of a collaborative approach, a robust operational framework or  
593 schedule, and a school-wide pro-AST culture. For future study, investigating children’s  
594 perspectives of AST interventions, ways to develop student champions of AST, and equity  
595 initiatives all hold significant potential to influence future programming.

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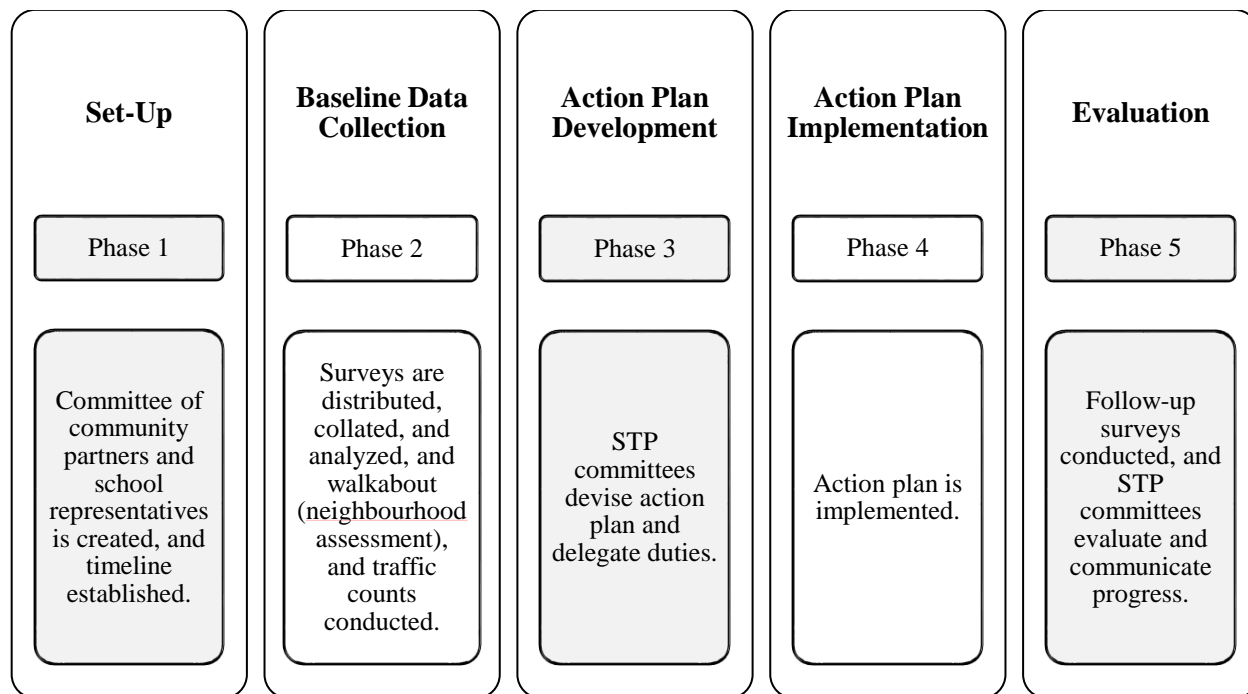
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789 **Appendices**

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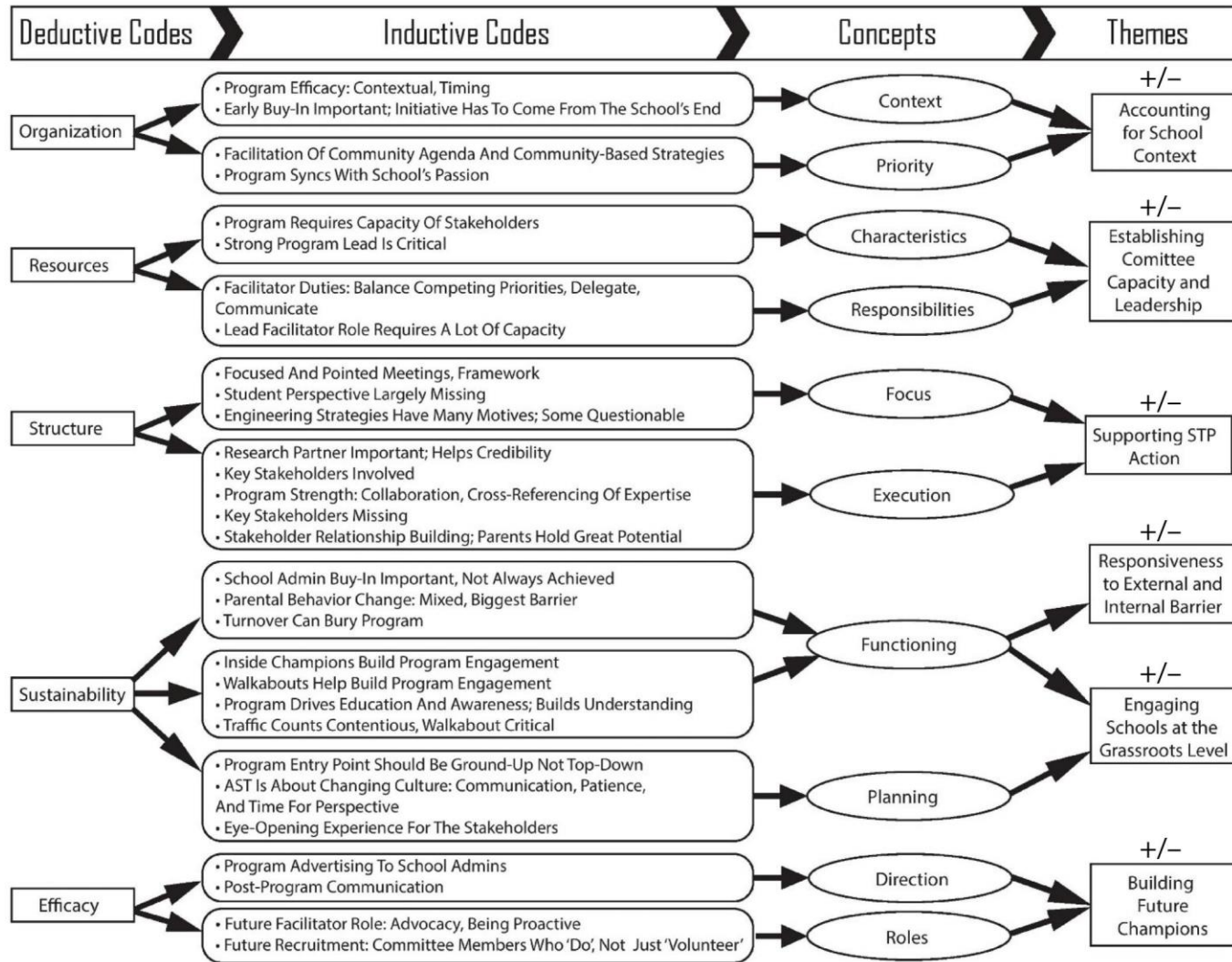
791 **Figure 1. School Travel Plan Intervention Model**

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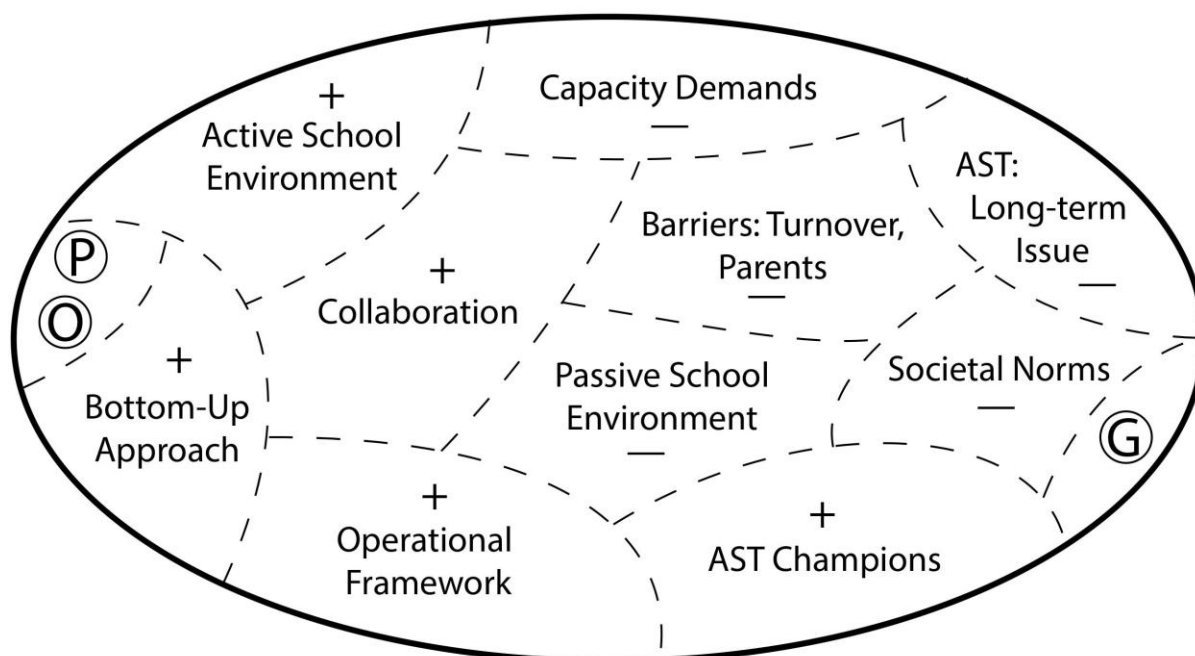


794 **Figure 2. Analysis and Code Map**



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797 **Figure 3. Field Theory Model Adapted to School Travel Planning**

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799 *P = population (STP committee), O = current situation, G = targeted goal (improved functioning and sustainability), and those*  
 800 *sectors between O and G represent various forces influencing change (Burnes and Cooke, 2013). "+" = facilitating force, "-" =*  
 801 *constraining force.*

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