A Scoping Review of Accessible Student Transport Services for Children with Disabilities

Timothy Ross
University of Toronto
tross@hollandbloorview.ca

Patrick Bilas
University of Toronto
patrick.bilas@mail.utoronto.ca

Ron Buliung
University of Toronto
ron.buliung@utoronto.ca

Ahmed El-Geneidy
McGill University
ahmed.elgeneidy@mcgill.ca

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Abstract

The governance and provision of accessible transport services for students with disabilities is complex and involves numerous stakeholders, from families and schools, to transport operators and various levels of government. Experiences of travelling to school via bus can also be remarkably difficult for children with disabilities and their families. Despite the complexity and challenges associated with accessible student transport, little has been written about this topic. This scoping review begins to address this knowledge gap. A description of our review process is followed by a detailed review of 20 documents (13 refereed articles, seven grey literature documents). We discuss the literature in relation to theoretical disability perspectives, stakeholder understandings of inclusive education, disability rights legislation, school board transport service challenges and concerns, and alternative accessible student transport methods and opportunities. We propose that scholars and practitioners consider, among other things, using a critical ableist studies perspective to help address ableism in student transport. We also call for improvements to bus driver training to help address challenging relationships that can emerge between drivers and families, and for greater collaboration with non-transport stakeholders to develop alternative accessible student transport service options.

1.   Introduction

In their recent World Report on Disability, the World Health Organization (WHO) and World Bank (2011) indicated that there are an estimated 120 to 150 million children under 18 years of age globally who are living with disability. While children with disabilities have a notable global presence, they continue to endure institutional neglect that produces challenging and, at times, exclusionary barriers in their everyday lives. This is not to say that efforts have not been made to advance their inclusion. For example, the barriers that challenge and exclude children with disabilities have received increased attention as a result of human rights struggles starting in the 1960s and 1970s, struggles that helped produce the 2007 United Nations Convention on the Rights of Persons with Disabilities (CRPD), and accessibility legislation (e.g., the United States' 1990 *Americans with Disabilities Act* and Canada's 2019 *Accessible Canada Act*[1]). In particular, the shift toward inclusive education starting in the 1960s in much of the West, while far from perfect, has been significant in advancing disabled children's inclusion (Graves & Tracy, 1998). This shift, which was geared toward preventing children from being excluded from education on the basis of disability, involved transformative changes to education rights, goals, and classroom populations (e.g., 'mainstreaming' or integration; see Kavale & Forness, 2000). It also involved bolstered efforts to provide accommodation supports and services in communities and schools (WHO, 2011; CRPD, 2007). Despite these changes, children with disabilities continue to encounter disabling barriers in education and other areas of their everyday lives. Barriers hindering education access have left many disabled children[2] excluded from educational opportunities that could benefit their

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[1]   Also, see the accessibility legislation enacted by three Canadian provinces: Ontario's 2005 *Accessibility for Ontarians with Disabilities Act*, Manitoba's 2013 *Accessibility for Manitobans Act*, and Nova Scotia's 2018 *Accessibility Act*.

[2]   While institutional bodies often encourage the use of 'people-first' language (e.g., stating 'children/people with disabilities'), we at times use alternative language (e.g., 'disabled children' or 'children living with disability') in

present and future lives (Loreman, 2014; Graves & Tracy, 1998; Lupart, 1998). The institutional provision of student transport services is responsible for producing access and, perhaps surprisingly, some barriers to education, as well as exclusionary experiences.

Providing accessible student transport services represents one of the more complex daily activities for schools and school boards, as there are differences in the challenges and responsibilities involved in transporting children with and without disability (Oklahoma State Department of Education (OSDE), 2006). For example, transporting children with disabilities may require handling specialized equipment such as power wheelchairs and oxygen tanks (OSDE, 2006), interacting with children's behavioural and/or medical needs, and overcoming communication difficulties (Falkmer et al., 2004). It also involves crafting accessible school travel policy (e.g., designing the service and its user criteria) that is aligned with legislation, and ensuring schoolyard interfaces match up with accessible buses (e.g., having buses park near accessible entrances and not in the way of accessible parking for private vehicles; see Ross & Buliung, 2019). Other requirements may include having educational assistants meet students at buses as needed, clearing snow and ice (in specific climate zones) from accessible routes, and ensuring accessible equipment (e.g., door openers, lifts) are well-serviced and operable. Without question, providing disabled children with safe and inclusive school travel requires considerable communication, collaboration, and planning among families, schools, school boards, student transport service providers, bus operators, and other stakeholders (Nakamura & Ooie, 2017). School travel (and transport in general) represents a complex intersection of actors and stakeholders, engineering and

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this paper to acknowledge disability terminology debates (see Ross, 2013; Titchkosky, 2001). These alternatives support consideration that disability arises from problematic interactions with the environment, services, and unquestioned attitudes (for more, see Ross, 2013).

design, technology, and policy, all of which contribute to the inclusion and/or exclusion experienced by those living with disability.

This scoping literature review (Munn et al., 2018; Arksey & O'Malley, 2005) examines what has been written about student transport services for children with disabilities. We conducted an initial exploratory search of reviews that intersect the topics of student transport services and childhood disability via Google Scholar and the University of Toronto library database; we did not locate any published review on this topic. The question guiding this review is, "what does the literature tell us about the provision and use of student transport services for disabled children?" Since the body of academic literature on this topic is small, we expanded our scope to include relevant legislation, reports, and policy/guideline documents. Engaging our central question is important because accessible school bus services are essential to disabled children's equal access to education (see UN-CRPD) and, consequently, their inclusion. Disabled children may not be able to use typical buses (i.e., their abilities may not map onto regular buses' access, egress, and seating), and their families may not have the time to transport them to/from school, nor the financial resources to arrange for private transport.

2.   Theoretical Considerations: Disability and Childhood

The biopsychosocial model (BPS) (Engel, 1977) of disability and critical ableist studies (CAS) (Goodley, 2014; Campbell, 2009, 2012; Wolbring, 2008) perspective informed our thinking about disability. The BPS model emerged in response to the conceptual tension between biomedical and social model understandings regarding disability.[3] The BPS model recognizes disability as the impairments, activity limitations, and participation restrictions that arise through people's (i.e., those with a health condition) interactions with their surrounding contexts (WHO &

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[3]   For more on the biomedical and social models, see Hughes & Paterson, 1997; Oliver, 1996.

World Bank, 2011). It claims to offer a more holistic approach to disability than the biomedical and social models, as it recognizes experiences of disability as arising from a combination of physical, emotional, and environmental factors (WHO, 2001). We felt that adopting this understanding of disability, which underpins the WHO's (2001) International Classification of Functioning, Disability and Health (ICF) approach to disability, would help to make this review more accessible to scholars across disciplines. It also helped us to keep in mind that disability is not merely bodily impairment, nor barriers organized into our material conditions; rather, it is a human experience cutting across many aspects of everyday life.

We also used a critical ableist studies (CAS) perspective because it draws attention to two issues that are mostly beyond the BPS model's scope: (1) normative values, and (2) the normalcy of exclusionary disability experiences. Wolbring (2008) describes ableism as a set of beliefs and practices that values and promotes certain abilities above others. Ableism is aligned with neoliberal values, supportive of a hyper-competitive free market economy, and is supported by schools expected to create active producers and consumers (Goodley, 2014, p. 25, 27). In valuing certain abilities over others, an ableist bias prioritizes and serves those whose bodies, physiologies, and cognitive capacities fit into a hyper-normative, 'species-typical' (Campbell, 2009) able-bodied concept that ignores much of our diversity (Goodley, 2014). The hyper-normative concepts of what constitutes citizenship and the exclusions they produce remain infrequently questioned. Further, some individuals and institutional bodies view and act towards disabled children as incapable of fulfilling the hyper-normative neoliberal citizen produced and perpetuated through ableism (Goodley, 2014, p. 33). Using a CAS perspective helped us to inquire into the normalized values potentially underlying school busing practices and systems.

We also intersect our disability studies perspective with the new sociology of childhood (Prout, 2005; James, Jenks, and Prout, 1998). This perspective reminds us that adults are often incapable of fully understanding children's experiences and communicating their viewpoints; therefore, we should acknowledge and embrace children's agency, as their desires, needs, and concerns can offer invaluable insights about what works for them, what does not, and what they would like to see changed in their everyday lives (Prout, 2005). Further, the new sociology of childhood recognizes that there are myriad ways in which childhood is experienced and understood within and across societies (Prout, 2005), and that these different experiences and understandings are configured with other aspects of social difference, including disability.

3.   Methods

From October to December 2017, we searched multiple databases for peer-reviewed articles and government legislation/reports over a 50-year period (1967-2017). We selected the 1967 start date because by this time school boards (e.g., in Australia and Canada; Loreman, 2014; Graves & Tracy, 1998; Casey, 1994) had started the practice of mainstreaming (i.e., integrating) disabled students into general education classrooms, and had begun providing student transport services. We chose databases with a view to identifying articles about accessible student transport services for disabled children across four relevant academic fields (i.e., engineering, transportation, social science, and biomedical). We searched a fifth database that comprehensively covers life, social, health, and physical sciences to help ensure we capture relevant articles. The five databases were: (1) Compendex via Engineering Village (for engineering); (2) Transport Database via Ovid (for transport); (3) Social Sciences Abstracts via EBSCO (for social science); (4) Embase via Ovid (for biomedical); and (5) Scopus (for life, social, health, and physical sciences). We updated our 2017 searches in October 2019. This update yielded 3 articles (Ross &

Buliung, 2018, 2019; Stephens et al., 2015) and 2 reports (CHRC, 2017; Dubé, 2017) for inclusion in the review, and extended the search period to 52 years (1967-2019).

The baseline search function that we applied to abstracts, keywords, and titles across databases was as follows:

> *((child* AND disab*) OR (youth AND disab*)) AND ((school transport*) OR (transport* to school) OR (school travel) OR (school commut*) OR (school busing))*

This search function included wildcard and Boolean operators to locate papers using search terms in their different forms (e.g., "child*" to capture "child" and "children"), and terms that might be used interchangeably (e.g., "child*" OR "youth"). Inclusion criteria were assessed with flexibility to increase the catchment of relevant literature. Inclusion criteria considered were:

- Published between 1967 and 2019
- Written in English
- Concerns or intersects childhood disability and school bus transport services
- Peer-reviewed article, legislation, or policy/guideline reports

Flexibility was applied when including five articles that concerned disabled children's education access and/or school travel, but were not directly focused on school bus travel (Ross & Buliung, 2018, 2019, Stephens et al., 2015, Loreman, 2014, Lupart, 1998).

The 2017 searches produced 68 articles that were screened by assessing how their abstracts and keywords connected with accessible student transport services for children with disabilities. Screening reduced the article set to 17. Citations within these 17 articles were searched to identify additional suitable articles. We also conducted Google searches to identify related policy, guideline, and legislation materials published by educational and governmental bodies. The search terms included: children, youth, disability, transport, school travel, school commute, school busing, special needs, special education, policy, legislation, and busing services. By searching

Google and the 17 identified articles' references, 40 additional documents were retrieved and, after screening, 7 were retained for the review.

From the 68 articles retrieved via initial database searches and 40 retrieved via searches of reference lists and Google, 15 records were duplicates and therefore removed. In total, 24 documents (i.e., 17 from searching databases, 7 from reference-mining and Google searches) went through an in-depth assessment to remove articles that initially appeared relevant, but had content that ultimately was not adequately connected with disabled children's use of the accessible bus services. This removed 9 documents, bringing the total to 15. After adding the five documents from the 2019 update, the final set of texts for this review was brought to 20: 13 peer-reviewed articles and 7 policy/guideline/legislation documents. Figure 1 illustrates our review process by detailing the stages of identification, screening, eligibility, and inclusion of articles (Moher et al., 2009).

Having explained how this review unfolded, we emphasize that there are innumerable ways that this review could have been conducted (e.g., by using different search dates, terms, databases, and inclusion/exclusion criteria). Since another review methodology may very well uncover different articles and/or reports and, in turn, new topics and issues, we recognize that this review could be missing data and note this as a possible limitation.

Figure 1: Scoping review search process.
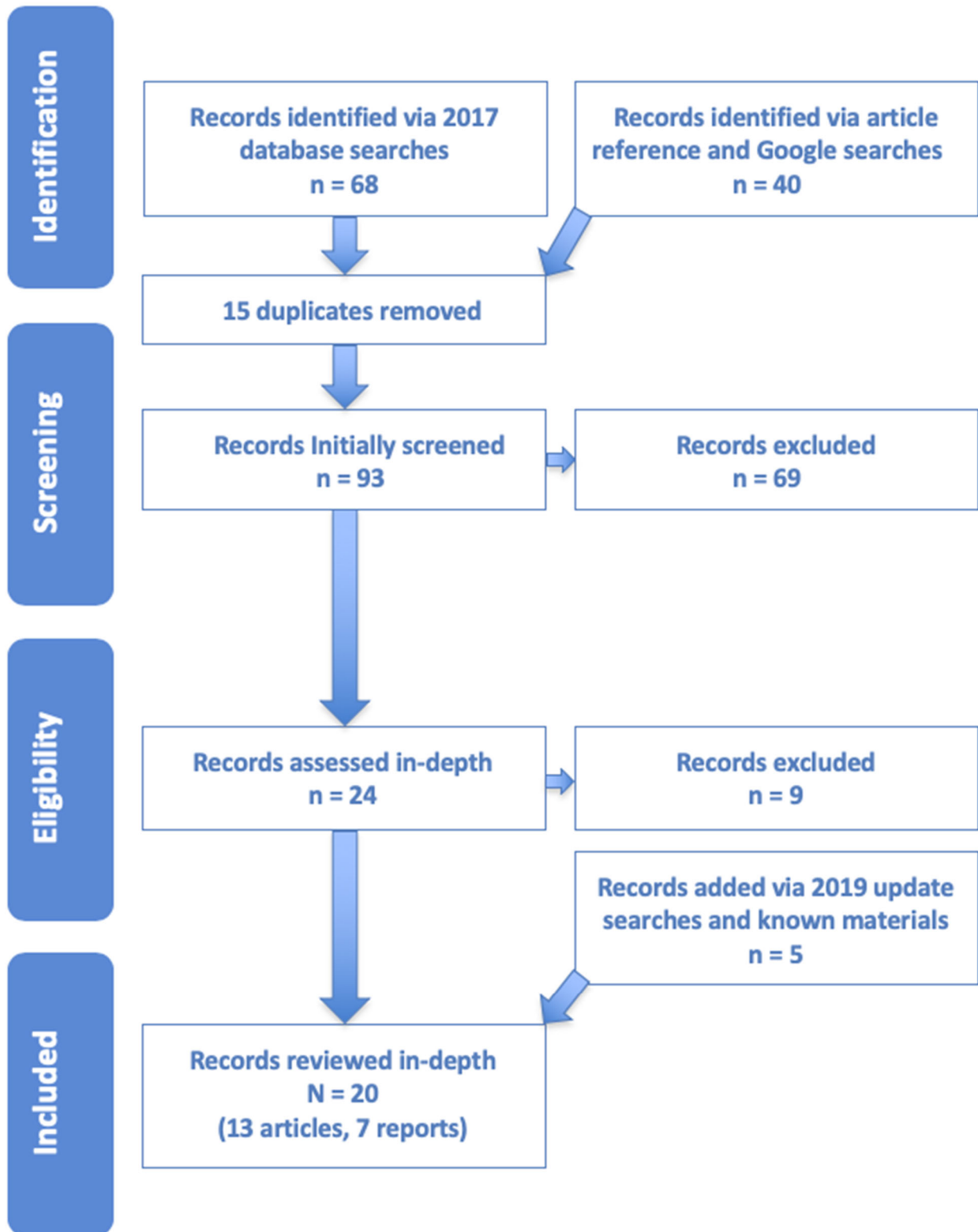
4. Results

Search result totals and sources are summarized in Table 1, while Table 2 describes the reviewed texts and offers some details about findings, participants, and locations. Five of the peer-reviewed articles were published in transport journals, 4 in health journals (including an accident/injury journal), 2 in education journals, 1 in an operations journal, and 1 in a childhood studies journal. Concentrations in the transport, education, and health fields suggest that the school busing/disability relationship has received little attention in other domains (e.g., public administration and disability studies). Most reviewed material (80%) was published after 2001, and geographically concentrated in Canada (35%), the U.S. (25%), and Sweden (20%). A research gap appears to exist in publishing on disability and school busing in other global regions. Our reading of the literature led to the identification of five key themes: (1) understanding disability, (2) stakeholder understandings of inclusive education, (3) disability rights policy and legislation, (4) school board transport service challenges and concerns, and (5) alternative accessible student transport methods and opportunities. In Table 2 we indicate the presence/absence of these themes in each piece.

Table 1: Search result totals by source.

Database	Initial Results	After Initial Screening	After In-Depth Review
Compendex	19	5	3
Embase	5	1	1
Google	40	7	6
Scopus	6	4	3
Social Sciences Abstracts	29	6	1
Transport	9	1	1
Total	*108*	*24*	*15 (+5 from 2019 update = 20)*

Table 2: Literature review summary and themes

Document	Description	Findings	Participants/ Location	Thematic Prevalence[4]				
				1	2	3	4	5
Studies								
Falkmer et al. (2014)	**Aim:** Explore if SAFEWAY2SCHOOL system and its instructions work well for children with cognitive disabilities. **Approach:** Show children videos of school journey scenarios and then question them about what they saw.	There are few differences in visual scanning patterns of children with cognitive disabilities compared to children in control group. The SAFEWAY2SCHOOL system aids children with cognitive disabilities.	14 children with cognitive disabilities, 23 children in control group/ Sweden & Australia	#	#	#	✓	✓
Falkmer et al. (2004)	**Aim:** Describe the transport mobility situation of children with autism spectrum disorders (ASD). Describe parents' perceived risk of children's school travel, and self-reported knowledge of relevant regulations and standards. **Approach:** Questionnaires completed by parents of children with ASD.	3 out of 4 parents were worried about their child(ren) using school transport or accessible school transport services. Worries were justified as children were not transported according to general safety recommendations.	1,631 parents with at least one child with ASD aged 2-16 years/Sweden	#	#	#	✓	✓
Falkmer & Gregersen (2002)	**Aim:** Describe parents' perceived risk of travel situation for their children with disabilities. Describe parents' self-reported knowledge of regulations and standards. **Approach:** Questionnaires were sent to 1302 families of children with cerebral palsy, spina bifida, muscular diseases, short stature, and osteogenesis imperfecta.	Parents were worried about professional drivers' lack of knowledge about the child, driving behaviour, inadequate safety measures, and poor postural sitting positions. Half of parents lacked knowledge of relevant safety regulations and standards.	1080 parents of children with the noted diagnoses aged 2-16/Sweden	#	#	#	✓	
Forsman & Falkmer (2006)	**Aim:** Evaluate a handbook for parents about safety and mobility of children with disabilities. **Approach:** Questionnaires were sent to 100- parents. 684 parents responded.	Parents' lacked information and handbook was useful, especially for contacts with bus drivers.	684 parents of children with disabilities under 19 years/ Sweden	✓	#	#	✓	
Graves & Tracy (1998)	**Aim:** Discuss inclusion of children with disabilities in education settings. **Approach:** Review literature on education for children with disabilities with focus on inclusion/segregation debate.	There are good arguments to encourage inclusive education for children with disabilities.	Not applicable/ Australia	#	#	✓	#	

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[4] Themes: (1) understanding disability, (2) stakeholder understandings of inclusive education, (3) disability rights legislation and policy, (4) school board transportation service challenges and concerns, and (5) alternative accessible student transport methods and opportunities.

Document	Description	Findings	Participants/ Location	Thematic Prevalence[4]				
				1	2	3	4	5
Loreman (2014)	**Aim:** Provide an overview of special education in Canada. **Approach:** Consider special education-related historical and modern trends, legislation and policy, school and classroom practices, family involvement, and differences by Province.	Approaches to special education vary widely across Canada. Poor educational outcomes for students with disabilities remain an ongoing challenge.	Not applicable/ Canada	✓	✓	✓	#	
Lupart (1998)	**Aim:** Argue that before progress toward inclusion in education can be realized, certain areas of education practice require review/transformation. **Approach:** Outline problems and paradoxes associated with relevant policy, organization, and legislation.	Current policy, organization, and legislation must be transformed to achieve equity and excellence in our schools. Universities may be in a key position to effect needed change.	Not applicable/ Canada	✓	#	✓	#	
Nakamura & Ooie (2017)	**Aim:** Explore the public transport and school travel needs of people with intellectual disabilities. **Approach:** Examine progressive initiatives in Brazil and Germany, and their potential adaptation in Japan.	Implementing mobility support for school trips that aid the mobility of people with intellectual disabilities requires cooperation among schools, transport operators, and administrators.	Not applicable/ Japan	#	#	#	✓	✓
Ross & Buliung (2019)	**Aim:** Explore how families living with childhood disability experience everyday parking at school. **Approach:** Interviews and photovoice with families of primary education-aged children with osteogenesis imperfecta, Duchenne's muscular dystrophy, or spinal muscular atrophy.	Families living with childhood disability must perform a lot of inequitable school travel work. School bus schedules and parking locations at times block access to the accessible parking spaces for private vehicles.	15 children with disabilities and 15 parents/ Canada	✓	#	✓	✓	
Ross & Buliung (2018)	**Aim:** Assess how disability has been considered in the active school travel and children's independent mobility literatures in comparison to other forms of social difference. **Approach:** Systematic review of disability's treatment in the literatures.	Disability has received less attention than other forms of social difference. Attention must be given to disabled children's viewpoints, disability's relationship to race/ethnicity and class, and disability perspectives.	Not applicable/ Canada	✓	✓	#	✓	
Russell & Morrel (1986)	**Aim:** Reduce special education bus route distances and trip durations. **Approach:** Assess the effectiveness of Clarke-Wright and M-TOUR algorithms for generating bus routes with reduced distances and durations.	A modified Clarke-Wright algorithm can be used to identify shorter bus routes with fewer stops in order to minimize bus trip times.	Not applicable/ United States	#	#	#	✓	

Document	Description	Findings	Participants/ Location	Thematic Prevalence[4]				
				1	2	3	4	5
Stephens et al. (2015)	**Aim:** Assess Ontario schools' accessibility and inclusivity for disabled children. **Approach:** Mixed-methods (case study and cross-sectional survey) study using child-/disability-friendly participatory techniques with children with mobility impairments.	Disabled children face significant barriers accessing education (i.e., getting to, into, and around school). Many adaptations and accommodations only generate partial accessibility or add to social exclusion.	Survey: 406 children (8-14); case study: 8 girls & 5 boys (10-14) with disabilities/ Canada	#	✓	✓	#	
Wheeler et al. (2009)	**Aim:** Improve understanding about differences between disabled and nondisabled children's travel patterns, means of transport, and getting needed transport. **Approach:** Conduct χ^2 analysis of variables using 2002 Transportation Availability and Use Survey for Persons with Disabilities.	Children with disabilities use school bus travel more frequently than children without disabilities. Disability severity, age, and income are associated with problems of getting needed transport.	846 children, 330 with disabilities/ United States	✓	#	#	#	
Legislation, Reports & Policy/Guideline Documents				#	#	#	#	
CHRC (2017)	Report presents a study of the state of education for people with disabilities in Canada.	Persons with disabilities report experiencing bullying, encountering barriers and being excluded at school.	Organizations representing Persons with disabilities/ Canada	#	✓	✓	#	
Dubé (2017)	Ontario Ombudsman report on the investigation into school bus service delays and cancellations in September 2016.	Report provides 42 recommendations to address busing issues, including some relating to childhood disability.	Not applicable/ Canada			✓	✓	
US Dept. of Education (2009)	Outlines a series of questions and answers pertinent to providing school transport services to students with disabilities.	Not applicable	Not applicable/ United States	✓	✓	✓	✓	
Oklahoma State Dept. of Ed. (2006)	Provides guidelines for the transport of students with special needs.	Not applicable	Not applicable/ United States	✓	✓	✓	✓	
UNICEF (1989)	Articles 23 and 27 of the UN Convention on the Rights of the Child address disabled children's right to participate in society, and to a standard of living adequate to their physical, mental, spiritual, moral, and social development.	Not applicable	Not applicable/ International	#	#	✓	#	

Document	Description	Findings	Participants/ Location	Thematic Prevalence[4]				
				1	2	3	4	5
United Nations (2007)	Article 24 indicates that persons with persons with disabilities are not to be excluded from free and compulsory education on the basis of disability, and are to have access to inclusive, quality, and free primary/secondary education.	Not applicable	Not applicable/ International	#	#	✓	#	
United States (2004)	The Individuals with Disabilities Education Improvement Act is a piece of federal legislation for ensuring education access for students with disabilities	Not applicable	Not applicable/ United States	#	#	✓	#	

'School board transport service challenges and concerns' (13 of 20 documents) and 'disability rights legislation and policy' (12 of 20 documents) were the two most common themes (Table 2). Documents about school board transport service challenges and concerns were generally geared toward recognizing and addressing school boards' various administrative challenges and concerns with respect to providing accessible bus services for disabled children. They also frequently reported on school transport challenges experienced by bus drivers, children, parents, and other stakeholders. Just over half of the documents concerning disability rights legislation and policy (i.e., 7 of the 13) were legislation, reports, and policy/guideline documents, meaning that only 6 peer-reviewed pieces engaged this topic. The themes of 'understanding disability' and 'stakeholder understandings of inclusive education' were present in 7 and 6 documents, respectively. The theme of 'understanding disability' was identified in documents where it was apparent that authors' thinking was informed by a certain theoretical disability perspective, or where they questioned how disability is conceptualized and experienced in relation to different theoretical disability perspectives. The theme of 'stakeholder understandings of inclusive education' emerged in articles engaging discussion and debate about parties' understandings of and approaches to inclusive education. The final theme, 'alternative accessible student transport methods and opportunities,' was the least common (3 out of 20); however, this theme had a larger global presence with studies considering atypical student transport services and programming in Australia (Falkmer et al., 2014), Brazil (Nakamura & Ooie, 2017), Germany (Nakamura & Ooie, 2017), and Sweden (Falkmer et al., 2004, 2014).

5.   Discussion

5.1   Understanding Disability

Our conceptualization of disability influences how we perceive and act toward disability-related issues and experiences. Few of the reviewed documents include any questioning about disability at a conceptual level. In some studies that investigate social aspects of disability (e.g., Forsman & Falkmer, 2006; Loreman, 2014), disability has been understood and approached implicitly using a biomedical lens. For example, in their evaluation of the usefulness of a child mobility handbook for parents (i.e., an intervention that is social in nature and well-aligned with the social model), Forsman and Falkmer (2006: 716) use a questionnaire organized to understand the handbook's usefulness in relation to four groups divided along biomedical dimensions: (1) autism/intellectual disability,[5] (2) cerebral palsy/muscular disease/spina bifida, (3) hearing impairment, and (4) visual impairment. While they briefly discuss some social aspects of childhood disability and provide informative findings, their methods and analysis indicate that their thinking about disability is primarily biomedical. That is not to say that taking a "clinical" approach is not perhaps necessary – as impairments can map to the ways in which a body moves, for example, triggering necessary changes in equipment to facilitate access to school.

Other models have been employed implicitly elsewhere. For example, in their investigation of the accessibility and inclusivity of schools for disabled children in Ontario, Canada, Stephens et al. (2015) appear to understand disability in terms of human rights and social model perspectives. They contextualize their study with human rights legislation and go on to discuss a substantial number of barriers to education access (e.g., in school sites, buildings, and transport) that challenge and exclude children with mobility impairments. Forsman and Gregersen (2002)

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[5] The term 'intellectual disability' has replaced the authors' use of 'mental retardation' here.

also appear to employ a social model understanding of disability. They investigate the perceived risks among parents of disabled children concerning their travel situations. In doing so, they identify numerous concerns that may be viewed as barriers to access and inclusion (e.g., concerns about drivers' lack of knowledge about the child, driving behaviour, lack of adequate safety measures, and poor postural sitting positions in vehicles) (Falkmer & Gregersen, 2002).

While understandings of disability can often be inferred from study designs and findings, sometimes this proves difficult. It may be especially difficult for transport scholars and practitioners who are unfamiliar with theoretical disability perspectives and their influences on project scopes and analysis. Explicitly describing conceptualizations of disability that inform study designs and analyses could prove useful moving forward. This could help to facilitate readers' assessments of study designs and findings. Further, it could expose readers to new disability perspectives, help them to question their own understandings of disability, and to approach transport-related research, policy, and practice in more nuanced ways.

The articles by Ross and Buliung (2018, 2019) differ from other reviewed documents due to their explicit discussions of theoretical understandings of disability. In these discussions, they encourage the consideration and use of a critical ableist studies (CAS) (Campbell, 2009; Goodley, 2014; Wolbring, 2008, 2008a) perspective in school transport planning and school site design. Student transport services and school sites designed from an ableist perspective can challenge disabled children's mobility, their ability to participate and interact with peers, and their education access in general. The normalcy of designs that overlook disability, perpetuate exclusionary disability experiences, and allow them to go unrecognized and unaddressed, warrants critical attention. Using a CAS perspective can support engagement with and questioning of the normalcy

of disability as excludable (Titchkosky, 2011) within school site designs and student transport services that are essential to ensuring education access (Ross & Buliung, 2018).

5.2   Stakeholder Understandings of Inclusive Education

Inclusive education is an approach to educating disabled children via special education programs, supports, and services inside classrooms with non-disabled peers (Graves & Tracy, 1998). The approach aims to provide equitable education for all within inclusive settings that offer disabled children ample educational opportunities, and allow non-disabled children to develop familiarity with disability, which could help to reduce future discrimination (WHO and World Bank, 2011; UNESCO, 1994). Inclusive education emerged in Canada and the U.S. during the era of integration (i.e., the 1960s and 1970s), and remains in place in many present-day education settings (Loreman, 2014; Graves & Tracy, 1998). Prior to integration, and during, in some places, there were periods of "institutionalization, segregation, and categorization" (Loreman, 2014, p. 36) that were highly discriminatory and even violent. These were deeply troubling times (i.e., which is not to say that violence, disability and education no longer co-exist), as the separation and labeling practices kept many disabled children from going to school, which is the first place where some experience independence and have opportunities to identify and establish who they are as a person (Graves & Tracy, 1998). Some still disagree with integration because they view disabled children as highly vulnerable within inclusive education classrooms to bullying, isolation, and teachers who may not have adequate training to support them (Kavale & Forness, 2000). It is true that one in four disabled students experience bullying (specifically related to the body-mind nexus) across Canadian schools, and more than one in four experience being avoided or excluded (CHRC, 2017). However, continuing practices that isolate disabled children in an effort to overcome lasting shortcomings in the accessibility of our education systems (e.g., inadequate

teacher/bus driver training, budgets for educational assistants, and school building and curriculum designs) would do little in terms of addressing these shortcomings and the gap in educational attainment between persons with and without disabilities in Canada. Persons with disabilities across Canada reporting "below high school" as their highest educational attainment range between 25% to 40%, while those without disabilities have reported a range of 15% to 33% (CHRC, 2017).

Integrated or inclusive education appears to start at the school entrance, while inclusive transport remains oddly unquestioned within this context. Since disabled children now commonly attend schools and share classrooms with non-disabled peers, some disabled children have naturally expressed a desire to travel to and from school with their non-disabled peers who ride the bus. However, they often cannot do so due to inaccessible bus designs, separation of services between "able and non-able bodies," and inadequate driver training (Office of Special Education and Rehabilitative Services in the U.S. Department of Education, 2009), and because they may undergo long trips outside their communities to access a subset of schools that offer accessible buildings and curricula (Dubé, 2017). This is unfortunate because school bus trips offer children opportunities to informally socialize with their peers. Removing or limiting these school travel experiences may prevent non-disabled children and disabled children from interacting and, in turn, contribute to disabled children feeling isolated and having a reduced sense of belonging within their own education settings. There are many challenges associated with providing integrated student transport services, such as equipping buses with wheelchair lifts, wide accessible doors on both sides, and providing bus drivers with the necessary disability training (Nakamura & Ooie, 2017; U.S. Department of Education, 2009).

5.3   Disability Rights Legislation and Policy

Legislation and policy are used to control and guide decisions that can influence disabled children's everyday experiences of education and mobility (*Individuals with Disabilities Education Improvement Act* (IDEA), 2004; Graves & Tracy, 1998; Lupart, 1998). For example, the United States' 2004 IDEA and Canada's 1982 *Canadian Charter of Rights and Freedoms* (CCRF) both aim to advance the rights and improve the experiences of children (Lupart, 1998; Loreman, 2014). The 2004 IDEA is a focal point of U.S. legislation for disabled children's education access and school transport services. The CCRF presents Canada's constitutional views of persons living with disabilities and acts as a guide for provincial or territorial education departments to follow (Loreman, 2014; Lupart, 1998). Federal legislation is influenced by conventions of international bodies, such as the United Nations Department of Economic and Social Affairs and the WHO, both of which explore disability and school transport issues (Loreman, 2014). Disabled children in Canada and the U.S. are legally entitled to free education, student transport services, and the ability to attend integrated classrooms with non-disabled students. These entitlements are well aligned with the conventions and aims of the UN, WHO, and other international bodies (IDEA, 2004; Lupart, 1998).

Canada's legislative approach to disability and education access has been more fragmented than that of the U.S. In Canada, provinces and territories handle education (including special education) separately from the federal government, while in the U.S., states follow an education blueprint provided by the federal government (Lupart, 1998). Canada's approach has led to issues of unequal access to special education and student transport services for disabled children across the country because funding, policies, and legislation can vary depending on each province's population, socio-economic factors, and policy/legislation decisions (Lupart, 1998). While its

approach has been fragmented, Canada has recently passed federal accessibility legislation (i.e., the 2019 *Accessible Canada Act*) that might help the nation to move past its fragmented accessibility legislation, policy, and guideline treatments (Council of Canadians with Disabilities, 2018), but the impact(s) remain to be seen. Canada's recent federal accessibility legislation will likely have an effect on lower-level governments' approaches to disability and accessibility. In turn, lower-level governments' concerns and actions pertaining to the legislation's implementation warrant attention.

At a finer scale, school services for disabled children are often tailored via policy tools, such as, in Ontario, Canada, an Individualized Education Program (IEP). An IEP is designed collaboratively by special education advisors, teachers, parents, and the student (depending on age) to identify the student's learning goals and required services (e.g., transport services, educational assistant services, test accommodations) that will facilitate the child's participation and education access (OSDE, 2006; IDEA, 2004). To support each child's accessible school transport, IEP team members must know about the child's abilities or clinical diagnosis, their required vehicle technologies (e.g., how they use lifts, how they need to be strapped into the bus) and mobility aids (e.g., wheelchair, walker, scooter, ankle/leg braces), the length of their daily commutes, and the emergency communication practices between the driver and student (OSDE, 2006). To improve policy and overall performance of disabled students' transport services, Nakamura and Ooie (2017) suggest that there is a need to increase cooperation and communication between schools, transport operators, traffic planners, and families. Such cooperation and communication is needed to craft comprehensive policy tools (e.g., IEPs that suit each disabled child's needs) that will help with carrying out accessible student transport services in an inclusive and safe manner.

5.4   School Board Transport Service Challenges and Concerns

Children with disabilities are more likely to require busing than non-disabled children, and will typically have longer school trips than children who travel to school via private family vehicles or modes of active transport (Wheeler et al, 2009; Falkmer et al., 2004). Their longer trips may be attributable to having to travel greater distances to attend a school that is physically accessible and/or has the programming and staff support they require. As is the case with the Toronto District School Board in Ontario, Canada, the distance problem is exacerbated by the presence of a sparsely located, adequately resourced, subset of schools. Undertaking these long trips to school with few or no peers in adapted school buses means that disabled children often start each school day without the informal peer interaction that non-disabled students experience as they walk or travel via regular buses to school (Stephens et al., 2015). Ensuring that these trips are safe and comfortable for disabled children, and considering ways for them to have peers on board buses during their trips, is important given that school travel experiences can have long-lasting effects (both positive and negative) on their sense of mobile independence and mental health (e.g., traumatic events and memories, their sense of belonging) (Forsman & Falkmer, 2006).

Ensuring disabled children's safety and comfort during school bus trips presents numerous challenges and concerns for school boards. One major challenge comes in the form of parental concerns about scheduling reliability and bus drivers' roles and training (e.g., are they adequately trained to help their disabled children with potential medical issues during bus trips? Does school board policy support or prevent them from physically helping their children if required?) (U.S. Department of Education, 2009; Dubé, 2017; Falkmer et al., 2004; Falkmer & Gregersen, 2002). Parents of children using adapted school buses have expressed serious concerns about bus drivers' behaviours and driving skills, and whether or not they follow protective safety protocols (Falkmer & Gregersen, 2002). Parents are also questioning and worried about emergency communication.

For example, does an in-bus configuration that leaves a child strapped in and unable to move at the back end of the bus allow for communication with a bus driver at the front? Are bus drivers trained for or provided with tools to support communication with non-verbal children (Falkmer et al., 2004)? The literature suggests that clarifying the roles, responsibilities, and training of bus drivers, as well as in-bus child-driver communication practices/protocols, warrant critical attention, both in research and practice.

Other student transport challenges facing school boards include dealing with each disabled child's unique vulnerability to road traffic injury through comprehensive IEPs and safety protocols, navigating bus drivers' potential liability in providing students with physical support, and overcoming parents' lack of confidence and trust in bus drivers' skills and training (U.S. Department of Education, 2009; Dube, 2017; Falkmer et al., 2004; Falkmer & Gregersen, 2002). Regarding safety and injury risk, there may be unique concerns about road traffic accidents involving busing. The greatest risks are of course injury and loss of life as childhood fatalities occur most often via road traffic accidents (Falkmer & Gregersen, 2002 Tingvall, 1987; Evans, 1991). For disabled children, these risks are heightened, as they represent the largest risk group among vulnerable road users for serious or fatal injury (Falkmer & Gregersen, 2002; Falkmer, 2001). Given that children with disability may have heightened vulnerability to road traffic injury, research on best practices for in-bus safety for disabled children, safe transitions in and out of buses, and safe school site/parking lot design could prove beneficial. In cases where drivers cannot satisfy a disabled child's support needs during school travel, it may be beneficial for researchers and school boards to investigate other means of supporting the child, such as the possibility of extending the scope of educational assistants' work (i.e., those who are – or should be – well-trained to support the child) to include school trips. Regarding safe school site/parking lot designs,

Ross and Buliung (2019) found that school bus parking locations can at times negatively affect the school trips of parents driving their disabled children and even force them to park far away off-site and then undertake pedestrian travel to get to the school. This is because school sites' technically accessible parking spaces are at times rendered functionally inaccessible during school pick-up and drop-off periods because the school buses, which park close to schools, block accessible parking spaces.

School bus drivers' experiences should also be folded into conversations about in-bus safety, support, and communications; transitioning in and out of buses; and safe school site/parking lot designs. Quite frankly, these drivers have an incredibly difficult job. They are often underpaid, overworked, working split shifts during peak traffic, and they frequently experience stressful situations that lead to resignation (U.S. Department of Education, 2009). Unfortunately, bus operators and school boards often defer 'extra' disability-related training to avoid spending time and money on drivers with uncertain commitments and low retention rates (Ontario Ministry of Education, 2018; U.S. Department of Education, 2009). Less experienced drivers may have inadequate training, which can contribute to stressful or even dangerous circumstances if they are driving an accessible bus. Bus drivers responsible for transporting disabled children may also encounter challenges when operating special equipment (e.g., lifts), dealing with challenging behaviours, helping with health issues, and serving as a seating specialist (i.e., placing and tying down wheelchairs, checking/fastening braces, and so on) (OSDE, 2006). Other challenges include instances of children resisting the application of safety restraints via physical acts and/or verbal statements that require additional assistance that a driver may not have during school trips (Falkmer et al., 2004). To handle such tasks, bus drivers require training and, in some cases, additional support. Research into driver experiences and training requirements may help with

advancing the design, safety, and efficiency of accessible bus services. Furthermore, it could help to enhance disabled children's student transport and mobility experiences, improve parents' trust in the services, and it may even help with school boards' and bus operators' bus driver retention (Forsman & Falkmer, 2006).

5.5   *Alternative Accessible Student Transport Methods and Opportunities*

We found several alternative methods and opportunities for accessible student transport. In this section, we review three cases: (1) Curitiba, Brazil's *Sistema Integrado de Transporte Para o Ensino Especial* (SITES) system; (2) Nordhorn, Germany's *Mobilität auf ganzer Linie* (MogLi) project; and (3) Sweden's SAFEWAY2SCHOOL project. We also look to 'The Independence Program' carried out by Holland Bloorview Kids Rehabilitation Hospital in Toronto, Canada, as we consider the possibilities that could exist through engagement with non-transport stakeholders.

Curitiba, Brazil's SITES system operates as a courtesy service, bringing children with disabilities from across the city via private buses to a central terminal, where they transfer to other vehicles traveling to their schools (Nakamura & Ooie, 2017). The system is scheduled so that children have 30 minutes at the SITES transfer hub to allow for variation in the transfer time requirements of children with different impairments (Nakamura & Ooie, 2017). The SITES system gives disabled children opportunities to learn about their local environments; to familiarize themselves with using public transit buses, navigating a bus terminal, and undergoing transfers independently (unless they have an attendant); and to interact with bus drivers and other commuters (Nakamura & Ooie, 2017). It also offers a framework for integrating student transport with public transit in a thoughtful, comprehensive manner, which could be transferred elsewhere (e.g., via policy transfer; see Dolowitz & Marsh, 1996). Reflecting on the transfer time, it could be practical to keep in mind the temporal work they are asking disabled children and their families

to undertake (e.g., scheduling and travel time), and consider what students who do not require this additional time will end up doing while waiting.

Nakamura and Ooie (2017) also looked at the MogLi project in Nordhorn, Germany. This program offers training to children with intellectual disabilities to support their successful school bus transport. The training is provided inside a bus that is the same as the one the children use in order to simulate their bus trips. Bus company staff, bus drivers, and local police provide the training (Nakamura & Ooie, 2017). Program designers claim that using authority figures with transport and safety expertise in the training process, combined with the simulation approach, may have a greater impact than if trainers were teachers or parents (Nakamura & Ooie, 2017). Involving bus drivers may also help to increase their knowledge and awareness of the children's varying needs and, in turn, improve services. More work is needed to see how the training translates into real world conditions (Nakamura & Ooie, 2017). Further, the training sessions must be carried out with an understanding of the children's baseline conditions, as well as their varying learning and communication abilities. Implementing a transport skills diagnostic test to assess each student prior to training may help to identify students who can or cannot participate and, if they can, it may help with tailoring the training and in-bus simulation (Roosen, 2014).

The MogLi Project also offers bus driver training within the framework of their legally mandated, regular training sessions. This training involves five learning areas: (1) facilities for people living with disability; (2) information about the MogLi Project itself; (3) understanding intellectual disabilities and characteristics of Down's syndrome and autism; (4) a practical learning module; and (5) responding to and interacting with persons with disabilities (Roosen, 2014). Only those trained in all five areas can transport disabled students (Roosen, 2014). Requiring bus drivers to receive such training before transporting disabled students likely helps to improve child-driver

communications, aids driver understanding of children's clinical situation and needs, and may prevent problems during trips.

Sweden's SAFEWAY2SCHOOL program offers a technological approach to advancing the safety of children's school trips. The program was conceptualized within a universal design framework and is intended to support the safe travel of children with disability (Falkmer et al., 2014). The program involves intelligent bus stops, GPS tags, on-board computers, and radio transmitter tags that identify and track disabled children labeled as vulnerable road users (VRUs) (Falkmer et al., 2014). Falkmer et al. (2014) fitted children viewed as VRUs with radio transmitter tags that send their personal information to bus drivers' on-board computers so that they have the necessary information in case of emergency, or if it is needed in the course of drivers' daily work (Falkmer et al., 2014). The tags are also integrated with intelligent bus stops so that when a child carrying a tag is within 100 m of a stop, it triggers the flashing of strategically placed lights to increase road users' awareness and caution (Falkmer et al., 2014). While the intent to provide safe travel for VRUs is laudable, we do find the pairing of radio transmitters to children as fitting in with problematic elements of the surveillance society debate.

From integrating student transport and public transit systems in Brazil, to simulated in-bus training programs in Germany, to technological innovations in Sweden, the three cases discussed above offer insights into the value of engaging outside parties (e.g., municipal transit planners in Brazil, teachers and police in Germany, and technology experts in Sweden) to create accessible student transport solutions. This leads us to ask, what if schools, school boards, and student transport service providers were to regularly invite other parties with other forms of expertise into their discussions? What if, for example, we were to consider the role(s) that could be played by those lending clinical and other forms of support to children with disabilities and their families?

As an example, we consider The Independence Program (TIP) operated by Holland Bloorview Kids Rehabilitation Hospital in Toronto, Canada.

TIP is for 17- to 21-year-olds with physical or cognitive disabilities who are aiming to live independently and/or attend university or college. For three weeks, they live on a campus while participating in several life-skills workshops (e.g., grocery shopping, meal preparation, money management). Later in the program, they use their new skills in a "City Survival" program that involves planning and carrying out activities, including the use of public transit and the assessment of destinations' accessibility features (Iqbal, 2019). A staff member joins each participant on their outings, but the participant is responsible for planning the trip, making any necessary calls to check on accessibility or hours, and making decisions during their trips (Holland Bloorview, 2019). In the case of TIP, the involvement of healthcare staff in programming to support everyday transport and education access led to a practical programming development. Further involvement of healthcare providers and others may very well lead to the development of more programs, accessible design innovations, and service changes.

The ways in which accessible student transport relates to and fits within school boards' broader student transport systems also seems to warrant further attention. This consideration may lead to greater service integration and school board/bus operator efficiencies, and opportunities for disabled student to informally interact with peers and vice versa. For example, why is it typically the case that accessible student transport (i.e., via adapted buses) is operated independently from the transport of so-called able-bodied students? Surely integration could present opportunities to deal with routing and capacity challenges, and to treat student transport itself as an important opportunity to more closely integrate students of all abilities. In any process of re-imagining accessible student transport, children with disabilities and their families should be consulted.

Children, along with their family members, can offer unique and useful insights that could help with identifying, removing, and preventing barriers that hinder their mobility and education access (Ross & Buliung, 2018, 2019; Pivik, 2010; Stephens et al., 2015).

6.   Conclusion

Five themes emerged from our review of 20 documents concerning accessible student transport services for children with disabilities. Regarding the theme of 'understanding disability', the reviewed materials showed that while authors may employ theoretical perspectives on disability, they regularly do so without explicitly discussing them. These missing discussions can make it difficult for readers – especially those unfamiliar with disability theory – to identify the understanding(s) of disability informing study design and analyses. Not communicating the disability perspective at the core of any study seems like a missed opportunity to facilitate readers' assessments of a study's design and scope, and to expose them to potentially new ways of thinking about disability. Explicitly discussing theoretical disability perspectives in school travel research (and transport research in general) could help to advance more nuanced thinking about disability, accessibility, and inclusion among transport scholars and practitioners. In turn, this could lead to more inclusive transport research projects, as well as more inclusive transport systems and services.

While inclusive education received ample consideration, questioning what constitutes inclusive education, and how accessible student transport services contributes to or limits equal access, should be encouraged as part of efforts to resolve ongoing issues of isolation, bullying, and budgeting for accessibility within education. It could also help with addressing the gap in educational attainment between persons with and without disabilities in Canada and beyond. Since in some places students with disabilities now regularly learn in the same classroom as their non-

disabled peers, disabled students may naturally wish to travel to and from school with their non-disabled peers. Questioning the integration of school transport remains surprisingly absent in research and in practice. Unsurprisingly, countries with fragmented approaches to disability legislation and policy can produce highly varied and unequal treatments of disabled students' education access across their geographical areas (Lupart, 1998). Further attention to understanding how countries produce fragmented approaches and identifying practical ways in which it can be addressed could be helpful.

Many school board transport service challenges identified in the reviewed materials concerned bus drivers. The concerns indicated that school boards must work to allay parents' distrust in bus drivers by clarifying bus drivers' roles and training requirements, and by improving communications with the children (U.S. Department of Education, 2009; Falkmer et al., 2004; Falkmer & Gregersen, 2002; Dubé, 2017). Other areas where improvements are required include the reliability of bus schedules (Dubé, 2017) and having clear protocols in the case of emergencies during school bus trips. Greater attention to disabled children's heightened vulnerability to road traffic injury throughout the development and implementation of accessible student transport service designs (e.g., pick-up and drop-off protocols, bus-to-schoolyard interfaces, parking designs) and policy (e.g., each student's IEP) would likely help to address many safety issues associated with school travel. Schools, school boards, and accessible student transport service providers could also enhance their service provision via improvements to how they engage and account for the issues and concerns of disabled children and their families. They could also enhance their student transport service provision by giving more attention to the spatial configuration of destinations. It is likely that many school boards could improve their accessible student transport and the inclusiveness of students' education experiences by studying the spatial

allocation of supportive resources and school sites capable of meeting the demand for integrated education programming, as the geography of integrated programming may indeed contribute to long distance bus travel (Russell & Morrel, 1986). Lastly, Ross & Buliung's (2019) study about parking at school suggests that those involved in designing safe school site/parking lot designs for accessible busing could benefit from maintaining a holistic perspective that considers all modes of travel to school (e.g., busing, private vehicles, walking, cycling) and experiences of families living with childhood disability.

Perhaps it is also useful to consider alternatives to current practices. The cases of alternative accessible student transport that we have reviewed include the integration of accessible student transport with public transit, simulated school travel training for students, highly integrated technologies, and a mobility/life-skills training program involving healthcare practitioners. While each case presents its own specific lessons and opportunities, all of the cases prompt questions about the potential to produce new outcomes through more regular engagement with non-transport stakeholders in accessible student transport service design and provision. It appears that engaging stakeholders not directly tied to student transport has proven beneficial across all cases. Further involvement of these and other parties may lead to the development of innovative approaches to achieving equitable, inclusive, and safe school travel for children with disabilities. As we move forward with advancing these services and, more broadly, education access, we urge scholars and practitioners to invite input and collaboration with non-transport stakeholders, to consider using a critical ableist studies lens to resolve the permeation of ableism in school transport, and to commit to recognizing the value of seeking input from children with disabilities and their families. These actions will almost certainly result in new perspectives and ideas that will help with identifying

and preventing exclusionary experiences that children with disabilities experience during school travel.

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