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Childhood Mobility Socialisation: The Influence of Social Environment, Infrastructure and Perception of the School Route on Active Mobility Modes

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1 ABSTRACT

Mobility patterns established during childhood play an important role in shaping travel behaviour later in life. While transport planning has traditionally focused on infrastructure and spatial accessibility, research on mobility socialisation emphasizes that children's everyday mobility is strongly embedded in social contexts. This study examines how social environment, infrastructural conditions, and route perception relate to active school travel among school-aged children.

The analysis is based on a multi-site survey conducted between November 2024 and January 2025 at six school sites in rural areas and small towns in Styria, Austria. Pupils aged 6 to 14 years and their parents were surveyed. The study combines information on pupils' school travel behavior with indicators of parental and peer influence, subjective assessments of the school route, and basic spatial and sociodemographic characteristics.

Walking to school was analyzed using a logistic regression approach, while wheeled school travel (cycling and scooter use) was examined using descriptive and bivariate methods due to a limited number of cases. The results show that socialization processes are more influential than infrastructural factors. Walking to school is primarily associated with social environments, particularly peer practices and parental orientations, whereas infrastructure and route perceptions do not exert independent effects once social factors are considered. Wheeled school travel is mainly shaped by peer dynamics and age-related autonomy, with infrastructure acting as an enabling rather than determining condition.

Overall, the findings suggest that strategies to promote active school mobility should extend beyond physical infrastructure and more strongly address social contexts, everyday practices, and peer dynamics in which children's mobility is embedded.

Keywords: Mobility socialisation, Active school travel, social environment, infrastructure, route perception

2 INTRODUCTION AND THEORETICAL FRAMEWORK

The transport sector is among the main contributors to greenhouse gas emissions in Austria. Since 1990, emissions have increased by around 40%, largely driven by domestic motorised private transport (Umweltbundesamt 2026). However, the need for a mobility transition extends beyond climate policy. It is also motivated by public health concerns from insufficient physical activity, car-oriented settlement and transport planning, and inequal access to mobility options. Adult mobility behaviour is strongly shaped by routines and habits, the foundations of which are laid early in life. A successful mobility transition should therefore not be reduced to questions of traffic safety or infrastructure design alone, but must also address health-related, ecological and social objectives, as well as issues of autonomy and participation. This places the following question at the centre of the analysis: how is mobility socially shaped during childhood, and which actors and contexts are particularly influential in this process?

2.1 Childhood mobility socialisation

Mobility is a defining feature of today's society and is deeply intertwined with prevailing lifestyles and economic structures. For a long time, mobility was predominantly approached from a technical or economic perspective, with transport planning and policy focusing on infrastructure provision, efficiency and system performance. Over the past two decades, however, increasing attention has been paid to how mobility patterns are embedded in social contexts. As a result, mobility has become a central topic of social-scientific

and interdisciplinary research (Ruhrort, 2025) Mobility behavior can be analyzed from different social-scientific perspectives, including lifestyle-oriented approaches, social-psychological models, and supply- or system-oriented concepts. The mobility socialization approach offers a particular advantage in that it addresses diverse role models and their mutual interrelations.

Socialization refers to the process by which individuals internalize socially shared norms, values and meanings through ongoing interaction with significant others and social institutions across the life course (Berger & Luckmann, 1966; Giddens, 1984). Key socialization agents or contexts include the family, the spatial environment, peers, school and media. These contexts shape mobility-related orientations and contribute to the development of specific mobility lifestyles. Tully and Baier (2018) conceptualize mobility socialization within a three-level framework, distinguishing between societal conditions (such as infrastructure, spatial differentiation and cultural guiding principles), meso-social contexts (including role models, school and peer groups), and individual conditions (such as attitudes, values, age and gender). Mobility is particularly salient during adolescence, as it enables young people to organize increasingly differentiated everyday lives across spatially separated domains such as school, leisure activities and peer networks. At the same time, mobility becomes an expression of autonomy and identity formation, since independent access to places is closely linked to social participation and self-determination.

2.2 Social environment, infrastructure and route perception

Empirical studies show that children's everyday mobility is shaped by the interaction of social and spatial influences. Parents act as primary socialization agents by structuring everyday mobility routines, communicating norms and safety-related expectations, and serving as role models for their children. Parental personal and social norms, as well as habitualized mobility practices within the family, shaped later travel behavior (Haustein et al., 2009). With increasing age, peers become important reference groups, contributing to the adoption of mobility practices through shared routines and social comparison, particularly in the school context. However, the social contexts of family, peers, school, and media do not stand alone but are interrelated contexts in which mobility-related orientations and practices are learned and stabilized (Baslington, 2008).

Another perspective emphasizes the material and spatial context defined by infrastructure. Research on children's independent mobility indicates that parental perceptions of sidewalk and street safety are closely linked to whether children are allowed to travel independently (Santos et al., 2013). Distance and the availability of walking and cycling infrastructure further provide everyday mobility opportunities (De Meester et al., 2014). Infrastructural conditions do not influence behavior directly but are mediated through route perception, that is, subjective evaluations of safety, comfort, and attractiveness by both parents and children. Together, social environment, infrastructure, and route perception provide a coherent analytical framework for examining how children's school travel behavior is shaped in everyday contexts.

2.3 Planning and project practice in school environments

Projects for the redesign of school environments by traffic planners are typically recommended to be carried out in cooperation with the respective local authorities. Problems with traffic management and traffic hazards around the school are usually first reported by parents to the school or directly to the municipality. Teachers are the second most important group of people who identify and report traffic safety problems in the school environment. If there are problems or requests for changes, schools usually contact the responsible local authority. Similar to socialization research, parental mobility practices and transport infrastructure emerge as factors for enabling active mobility by schoolchildren.

If a project is given to a planner, technical considerations are made as to how the situation in front of and around the school can best be resolved in the interest of all road users, with particular focus on the pupils. Not every street is equally suitable for a 'school street', shared space or other structural or design measures. The type of planning intervention must therefore be carefully considered by experts in each individual case.

In the municipality of Frohnleiten, the primary school and secondary school are located in a school complex on the same street. A new housing development was planned for the same street in 2021. In response, the municipality approached the traffic planning company verkehrplus to implement traffic calming measures for the sensitive school area. The aim was to ensure the safety of pupils and the smooth flow of traffic, especially at the beginning and end of the school day. During the planning process, information evenings in

cooperation with the local police were held for the teachers. Feedback and suggestions were included in the planning process. Parents were informed by e-mail after the planning had been completed. In other municipalities, such as in an ongoing project to introduce a school street in Steyregg in Upper Austria, an information evening is planned before the school street is implemented.

The introduction of walking buses or bike buses ('Pedibus' or 'Bicibus') is often initiated by committed parents or teachers. These projects are usually implemented by local authorities, as was the case in Gleisdorf, for example, who may call in experts for advice and implementation.

Experience in various schools has also shown that the exemplary behavior of individuals influences the whole group. For example, a new kiss-and-go zone was set up at the St. Veit primary school in Southern Styria. The zone is located at an alternative entrance to the school away from the courtyard in front of the school, where buses stop and teachers park. The new entrance was only accepted after the headmistress specifically asked the respective parent representatives of the individual classes to use the new kiss-and-go zone and thus set an example for their classes.

3 STUDY DESIGN AND METHODS

3.1 Context and Research Area

The study was conducted as part of the FFG-funded project "Auf vertrauten Wegen" , which aims to promote active mobility by analyzing school routes together with pupils and co-developing context-specific interventions. The project was implemented at three primary and three secondary schools located in rural areas and small towns in the Austrian province of Styria. At each site, pupils' everyday school routes were examined and discussed, forming the basis for the collaborative development of measures to encourage walking and cycling.

The selected schools differ markedly in the characteristics of their immediate school environments. Some sites already feature traffic-calming measures, such as access restrictions for cars or designated 'school streets', while others are characterized by higher levels of traffic and frequent parental drop-offs, hindering active travel to school by foot or bicycle. Prior to the development of interventions, a comprehensive survey of all pupils and their parents was conducted at each of the six school locations to establish a baseline for the subsequent analyses.

3.2 Data Collection and Sample

The multi-site survey was conducted between November 2024 and January 2025. The extended survey period resulted from different start dates and differing implementation schedules across school sites, which were coordinated locally by teachers (pupil surveys) and school administrations (parent surveys). Primary school pupils were surveyed using paper-based questionnaires administered in class, while surveys at secondary schools were conducted digitally during class time under teacher supervision.

The parent survey was more extensive than the pupil questionnaire and was distributed via school-internal communication channels. Online questionnaires were created and administered using the open-source survey software LimeSurvey. To increase response rates, two reminder messages were sent to parents at each site. Following data collection, pupil and parent datasets were merged into a single analytical dataset. This matching procedure reduced the final sample size to n = 235, as each pupil needed to be uniquely linked to one responding parent for inclusion in the multivariate analyses (see table for response rates and site-specific sample sizes).

Municipality	Inhabitants (2025)	School type	Number of pupils	Sample size pupils (n)	Response rate pupils (%)	Sample size parents (n)	Response rate parents (%)
Frohnleiten	6.690	primary	241	187	78	87	36
St.Veit/Südst.	4.426	primary	94	79	84	31	33
Zeltweg	6.993	primary	229	214	93	75	33
Frohnleiten	6.690	secondary	190	131	69	45	24
Gleisdorf	11.533	secondary	350	219	63	127	36
Zeltweg	6.993	secondary	104	88	85	28	27

Table 1: Overview of study sites and survey samples; source: population data Statistik Austria (2025)

3.3 Analytical approach

Building on the theoretical framework, which conceptualizes children's school mobility as the outcome of interactions between social environment, infrastructural conditions, and route perception, this study examines which socialization agents, spatial factors, and distances are associated with pupils' active school travel. Two binary dependent variables were specified. The first captures whether a child walks to school (1 = walking, 0 = not walking). The second model examines wheeled active travel, combining cycling and scooter use into a single outcome variable (1 = wheeled mode, 0 = not wheeled). Statistical analyses were conducted using SPSS, complemented by additional data procedures in R.

Survey data from parents and pupils were processed using a standardized multi-step procedure. Data preparation included the removal of duplicate cases, incomplete responses, and identifying information, as well as consistency checks of names, school class identifiers, and school information. Variables required for linking parent and pupil records were harmonized across datasets in terms of formatting, spelling, and variable type, and standardized (e.g., uppercase lettering, trimmed spaces). Address information was manually reviewed and supplemented where necessary. Parent and pupil datasets were then merged stepwise using a composite linkage key (first name, school, class, postal code), supported by manual plausibility checks to resolve ambiguous matches. The final analytical dataset included only consistently matched and valid cases.

Descriptive analyses were used to examine modal split patterns for pupils and parents. Reliability analyses and exploratory factor analyses informed the aggregation of similar items to composite variables. Predictors of walking to school were examined using a multivariate Firth-penalized logistic regression model. The regression model for using wheeled modes did not provide robust multivariate estimates because of a skewed distribution in the outcome variable. Wheeled school travel was therefore examined using descriptive and bivariate statistical analyses. The variables used in the analyses are outlined below.

3.3.1 Transport mode choice

Pupils were asked how they usually travel to and from school under good or bad weather conditions. Parents were additionally asked about their mode choice across several everyday trip purposes, including work or education, shopping, errands, escorting children, and leisure activities.

3.3.2 Parental social norms

Parental attitudes and norms related to children's active travel were measured using items capturing perceived social norms and parenting-related orientations. Descriptive and injunctive social norms assessed how strongly parents perceive active school travel to be supported and valued within their social environment. All norm items were recoded so that higher values indicate stronger pro-active-travel norms.

Parenting style items captured a family-centered orientation emphasizing emotional closeness, shared decision-making within the family, and difficulties with letting go. Higher values thus reflect stronger family embeddedness and parental involvement rather than early autonomy support. Exploratory factor and reliability analyses revealed a stable two-factor structure with good internal consistency, distinguishing mobility-related parental social norms (parent_norms_active) from a general family-centered parenting style (parent_family_centered_style).

3.3.3 Peer mobility shares

For each school class (school_class_id), relative peer shares (0–1) were calculated for walking and for wheeled modes (bicycle, scooter, e-scooter), representing the proportion of classmates using each mode on the school trip (peer_walk_share_class, peer_wheeled_share_class).

3.3.4 Parental active mobility share

Based on parents' reported mode choices across all trip purposes, mean shares of active mobility were calculated. Two indicators were derived and included in the models: the proportion of trips made on foot and the combined proportion of trips made by bicycle, scooter or e-scooter, reflecting parents' everyday preference for walking and cycling (parent_walk_share, parent_wheeled_share).

3.3.5 Infrastructure

Objective assessments of walking and cycling infrastructure are excluded because of multicollinearity issues in multivariate models from low variance between the six school sites. Therefore, infrastructure is measured by parents' ratings of sidewalks and bicycle lanes (infra_rating_sidewalks_new, infra_rating_bikelanes_new). Higher values indicate more positively evaluated infrastructure conditions.

3.3.6 Pupils' and parents' route evaluation

Pupils and parents were asked to evaluate the school route by rating a set of statements using a Likert-type scale. Several factor solutions were tested. An eight-item solution was selected as the best compromise between explained variance and informative value. Factor 1 captures parents' and pupils' evaluations of the route with regard to perceived safety, difficulty and overall comfort, including feelings, like fear or perceptions of well-being and ease when using the route (parent_safety_comfort, kids_safety_comfort). Factor 2 captures parents' and pupils' evaluation of the route with regard to presence of nature elements and the perceived novelty of the route (parent_environmental_attractiveness, kids_environmental_attractiveness). All route perception scales are coded so that higher values indicate more negative evaluations (e.g., higher perceived danger, stress, or discomfort), meaning that odd rations below 1 reflect decreasing likelyhoods of active travel with worsening route perceptions.

3.3.7 Distance

Distances to school were calculated based on geocoded home and school locations (straight-line distance). Address data were prepared and standardized in Excel and then geolocated using an automated geocoding service. Where exact house numbers were missing, locations were approximated using street midpoints or central reference points for the respective municipality or district. In cases with ambiguous address information, conservative assumptions were applied and results were manually checked for plausibility. Exemplary geocoding outcomes were manually verified to ensure spatial consistency and reasonable distance estimates.

Age and gender were included as control variables to account for basic socio-demographic differences that may influence pupils' school travel behavior.

4 RESULTS

4.1 Descriptive results – Transport mode choice

A comparison of modal choice by school grade shows that walking is more common among primary school pupils than among secondary school pupils (good weather: 42% vs. 30%; bad weather: 33% vs. 28%). In contrast, secondary school pupils travel to school by wheeled modes substantially more often (14%) than primary school pupils (3%). This difference can partly be explained by the Austrian "Radfahrprüfung", which is typically completed in the fourth year of primary school and grants children permission to cycle independently in traffic. Primary school pupils are also more frequently driven to school by car (good weather: 23%; rainy/cold weather: 40%) compared to pupils in secondary schools (18%; 27%).

The six school sites differ substantially in modal choice. Among primary schools, St. Veit/Südsteiermark shows the lowest share of pupils walking in all categories (including the return trip), with walking shares ranging from 7% to 21%, and the highest share of car use (up to 73%). In contrast, the primary school in Frohnleiten records the highest proportion of pupils walking to school (41–57%). A plausible explanation for this difference lies in the immediate school environment in St. Veit, which is less pedestrian-friendly and was also perceived as unsafe by respondents in the survey – while Frohnleiten shows more favorable conditions for walking.

Among secondary schools, Zeltweg stands out, showing the highest shares of wheeled modes (up to 10% cycling and 3% scooter) and walking (up to 47%). These patterns may be explained by site-specific characteristics. By contrast, in Gleisdorf, the municipality covers a large geographic area and the secondary school attracts pupils with longer travel distances, which in many cases exceed feasible ranges for active mobility. Consequently, a substantial proportion of pupils rely on public transport, with up to 43% traveling by bus and 10% by train.

A comparison between good and rainy/cold weather conditions further indicates that the primary school with the highest car use, St. Veit/Südsteiermark, also exhibits the strongest increase in car-based travel under adverse weather conditions (from 48% to 73%). Generally, pupils are more likely to walk or use wheeled modes under favorable weather conditions, while car use increases when weather conditions worsen.

4.2 Predictors of active school travel

The logistic regression model for walking to school is statistically significant (LR $\chi^2(12) = 105.13$, $p < .001$) and explains substantial variance in pupils' walking behavior. Overall, the results underline the central importance of socialization processes, while infrastructural conditions and route perceptions show no independent effects once social factors are taken into account.

The strongest predictor of walking to school is the mobility behavior of peers (classmates). The class-level share of pupils who walk to school is very strongly associated with individual walking behavior (OR = 156.31, $p < .001$). Walking appears to be a taken-for-granted and socially reinforced practice when it is common within the classroom context. Parental influences also playges a decisive role. Children are more likely to walk when parents perceive active travel as valued within their own social environment (OR = 3.57, $p < .001$). In addition, a family-centered parenting style has a positive effect (OR = 1.73, p = 0.39), indicating that more family-centered orientations are associated with higher odds of walking to school. Beyond norms and parenting style, parents' own walking behavior is a significant predictor (OR = 1.04, $p < .001$), highlighting the importance of everyday role modelling and habitual practices within families.

By contrast, infrastructural variables and route perceptions do not show statistically significant effects in the walking model. Neither parents' nor children's assessments of safety, comfort, or environmental attractiveness of the school route are associated with walking once parental and peer norms are included. This indicates that perceived infrastructure quality and route experience may be necessary but not sufficient conditions for walking, and that their effects are largely mediated through social contexts.

Finally, distance to school, age and gender do not exert significant influences. Taken together, the walking model demonstrates that children's walking to school is primarily shaped by their social environments, rather than by infrastructural conditions or route perceptions.

Table 2 reports the results of a Firth-penalized logistic regression model examining social, infrastructural and perceptual predictors of walking to school.

Predictor	β	SE	OR	95%-CI (OR)	p
(Intercept)	-3.20	1.81	0.04	0.0007–1.61	.089
parent_norms_active (social environment)	1.26	0.32	3.57	1.89–7.69	< .001
parent_walk_share (social environment)	0.043	0.013	1.04	1.02–1.08	< .001
parent_family_centered_style (social environment)	0.55	0.26	1.73	1.03–3.12	.039
peer_walk_share_class (social environment)	5.05	1.26	156.31	13.45–2892	< .001
infra_rating_sidewalks_new (infrastructure)	-0.16	0.26	0.86	0.49–1.47	.574
kids_safety_comfort (route perception)	-0.17	0.27	0.84	0.48–1.52	.562
kids_environmental_attractiveness (route perception)	-0.03	0.23	0.97	0.59–1.56	.889
parent_safety_comfort (route perception)	-0.40	0.32	0.67	0.33–1.32	.253
parent_environmental_attractiveness (route perception)	-0.26	0.24	0.77	0.46–1.26	.305
distance	-0.29	0.16	0.75	0.49–1.02	.095
age	0.04	0.11	1.04	0.83–1.31	.722
gender (male)	0.34	0.47	1.41	0.54–3.85	.489

Table 2: Predictors of walking to school, n = 169, LR-Test $\chi^2(12) = 105.13$, $p < .001$; method: Firth-penalized logistic regression); DV: walking to school (1/0). Regression coefficients (β), standard errors (SE), odds ratios (OR), and 95% confidence intervals.

Due to the small total number of pupils using wheeled modes (cycling or scooter), the dependent variable has too little variance for calculating multivariate regression analyses. Consequently, wheeled mobility was examined using descriptive and bivariate analyses, comparing the groups of pupils who do and do not use wheeled modes. The bivariate results highlight a pronounced peer effect. Pupils who travel to school by wheeled modes visit school classes with significantly higher shares of peers also using wheeled modes ($p < .001$). This finding indicates that wheeled mobility is closely linked to shared mobility practices within the classroom, mirroring the strong peer effects observed in walking. Age emerges as another key factor: wheeled users are significantly older than non-users ($p < .001$), reflecting increasing autonomy, cognitive and motor skills, and formal permission to cycle independently with age.

In contrast to walking, parents play a limited role for wheeled mobility. Neither parental mobility-related norms, nor parents' own wheeled travel or parenting style show statistically significant associations. This

suggests that wheeled school travel is less embedded in family routines and parental socialization processes and that the influence of peers becomes more salient with age.

With regard to the built environment, pupils using wheeled modes rate the cycling infrastructure more positively ($p < .05$), indicating that infrastructure supports this mode of active travel. At the same time, wheeled pupils report higher levels of perceived fear and danger along the school route ($p = 0.40$), suggesting that wheeled mobility is often adopted despite, rather than because of, high subjective safety.

Overall, the wheeled results point to a mobility pattern that is primarily shaped by peer dynamics and age-related autonomy, with infrastructure facilitating this behavior.

Predictor	**Mean rank (other)**	**Mean rank (wheeled)**	**Test statistic**	**p**
parent_norms_active (social environment)	116.18	85.28	U=1228.5, Z=-1.815	.070
parent_wheeled_share (social environment)	106.13	127.11	U=1125.5, Z=-1.785	.074
parent_family_centered_style (social environment)	113.39	122.03	U=1559.5, Z=-0.507	.612
peer_wheeled_share_class (social environment)	111.06	164.12	U=967, Z=-4.709	<.001
infra_rating_bikelanes_new (infrastructure)	108.47	141.35	U=1218, Z=-2.110	.035
parent_safety_comfort (route perception)	98.22	95.33	U=1310, Z=-0.190	.849
parent_environmental_attractiveness (route perception)	98.37	93.60	U=1284, Z=-0.314	.753
kids_safety_comfort (route perception)	112.46	78.81	U=1125, Z=-2.049	.040
kids_environmental_attractiveness (route perception)	110.87	98.94	U=1447, Z=-0.727	.467
age	111.48	187.18	U=643, Z=-4.495	<.001
gender (male)	–	–	–	.310
distance	118.17	108.94	U=1699, Z=-0.541	.588

Table 3: Correlates of wheeled school travel. n=216, mean ranks; U and Z for Mann-Whitney U test in all predictors except Fisher-test for gender

5 DISCUSSION AND CONCLUSION

5.1 Implications for Planning and Intervention Design

Surveys of parents and pupils as well as the results of workshops in school classes with pupils from 6 to 14 years have shown that children's active travel behavior is strongly influenced by the social norms set by their peers. Schoolmates who jointly walk to school, use the scooter or cycle to school allow children to engage in playing and exploration activities with their friends during the school trip. Parents function as role models and gatekeepers with regards to walking. However, once children have grown older and can safely ride the scooter or the bike, this parental influence diminishes. Infrastructure and route characteristics may provide enabling conditions for active school travel, but their influence is much weaker than the influence of peers and parents.

Projects for redesigning school environments or for school mobility management should therefore target not just children directly, but should also leverage peer or parental dynamics that might emerge once children commence to shift their travel patterns. In particular projects in primary schools should explicitly work not just with children, but should address the parents as well. It must also be taken into account that parents are concerned about the safety of their children. Infrastructure projects in the school environment, such as school streets and shared spaces, can create a safe school environment and, together with the establishment of kiss-and-go zones on the periphery of school areas, make it possible to drop off children safely. However, improving infrastructure alone will most likely yield limited effects unless peers and parents are also engaged in, for instance, competitions or mobility exercises. We thus recommend approaches where schoolchildren are motivated to travel together and where parents are involved to revise their own mobility patterns.

Participation formats in schools make valuable contributions to surveys and polls: on the one hand, playful formats and joint visits allow the motivations of children and young people on the topic to be discovered directly and immediately, and on the other hand, substantial awareness is raised and the students communicate their findings and experiences in their peer groups and families. Role-playing facilitates understanding of different perspectives (parents, teachers, children), and walking to school together allows children to experience the challenges firsthand. With this jointly developed understanding, mobility infrastructures can be planned and implemented in an optimal and needs-based manner.

5.2 Limitations and Outlook

Despite high response rates among pupils (63–93%), the final analytical sample was reduced to N = 235 due to lower response rates in the parent survey (24–36%). As parent-child linkage was required for the multivariate analyses, this imbalance reduced statistical power and limited the applicability of regression models for wheeled school travel.

A further limitation relates to the survey period, which extended from November 2024 to mid-January 2025. Seasonal effects, weather conditions and the timing around the turn of the year may have influenced reported travel behavior. In addition, home-school distances were calculated as straight-line distances. While this approach ensured consistency across sites, it does not fully capture actual route choices or topographical conditions, which may be particularly relevant in rural and small-town regions in Austria.

Looking ahead, the project “Auf vertrauten Wegen” will proceed with the implementation of interventions co-developed with pupils, such as Pedibus stops and routes, cycling training programs or the redesign of a school forecourt. A follow-up survey is planned at the same schools to assess potential changes in mobility behavior and perceptions resulting from both infrastructural and behavior-oriented measures.

Feedback from pupils and parents indicates that the questionnaires were generally well understood and well received. However, the detailed breakdown of parental mobility by multiple trip purposes proved challenging for some respondents and reduced the response rates. Future surveys should therefore aim to balance analytical precision and respondent burden, particularly when addressing children and their parents. Despite these limitations, the consistency of key findings across multiple sites and school levels suggests that the results are robust and informative for schools in rural areas and small towns.

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