Scuola universitaria professionale della Svizzera italiana
Dipartimento ambiente costruzioni e design
Istituto sostenibilità applicata all'ambiente costruito

SUPSI

S2HOES – Safe and Sustainable HOme School Mobility
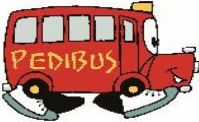
Preliminary study

Final results

August 2021

14 ottobre 2021

Project partners

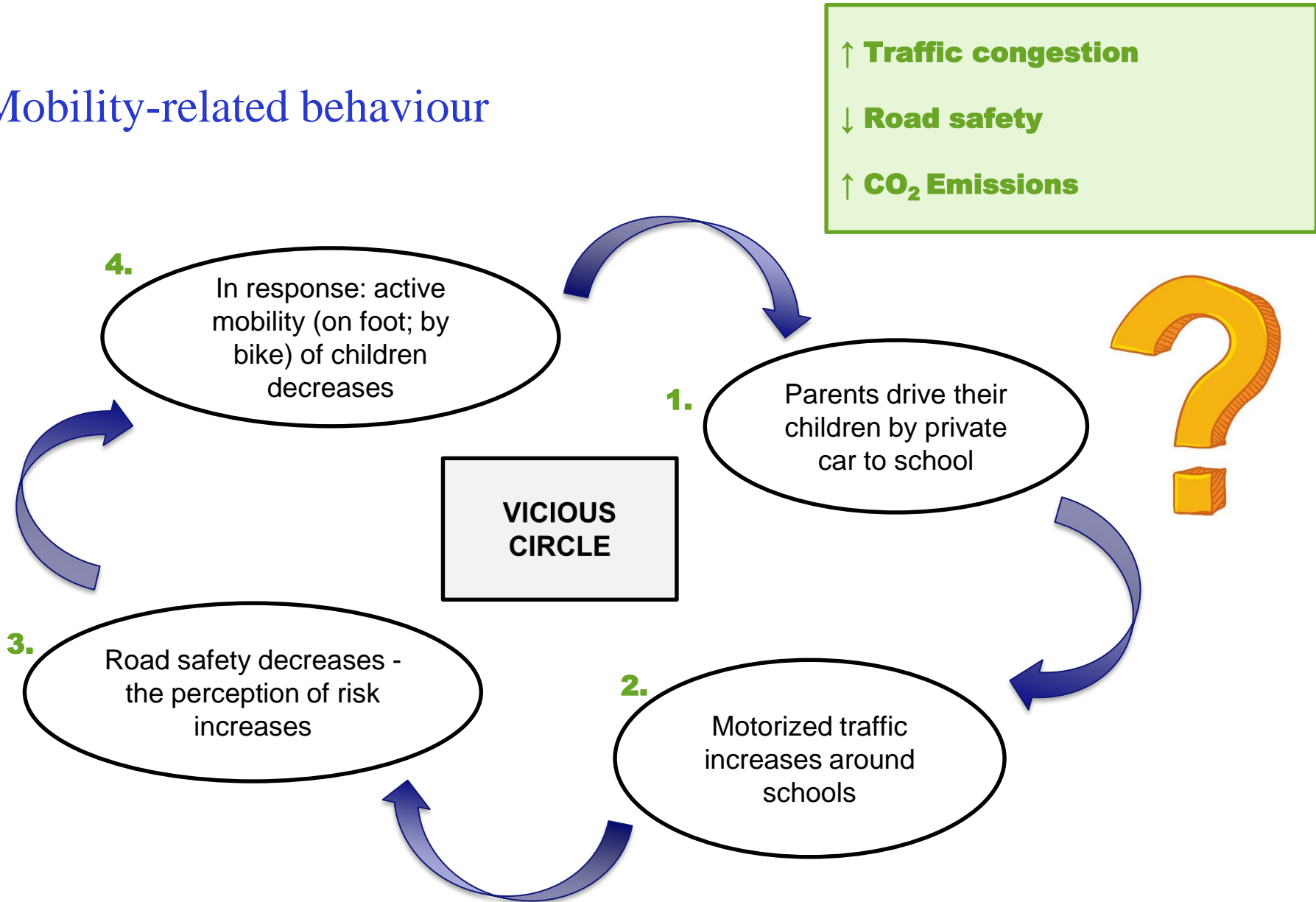|	
Scuola universitaria professionale della Svizzera italiana **SUPSI**	**SUPSI – Istituto di sostenibilità applicata all'ambiente costruito (ISAAC)**
PEDIBUS — Per una mobilità più sostenibile **ata**	**ATA - Coordinamento Pedibus Ticino**
FONDAZIONE BRUNO KESSLER	**Fondazione Bruno Kessler – Centro per le Tecnologie dell'Informazione e della comunicazione (ICT)**

With the funding of: AXA | AXA Stiftung Prävention

Mobility-related behaviour

↑ **Traffic congestion**

↓ **Road safety**

↑ **CO_2 Emissions**

4. In response: active mobility (on foot; by bike) of children decreases

1. Parents drive their children by private car to school

VICIOUS CIRCLE

3. Road safety decreases - the perception of risk increases

2. Motorized traffic increases around schools

How to stimulate a change in the (daily) practices of school mobility?

Main aim

Raise awareness of children and families about sustainable and safe mobility

Keys to success
- ✓ Trigger interest, **motivate**, engage (emotionally) the person;
- ✓ Support families with **practical solutions**;
- ✓ Involve the **whole school community** (children, school, parents);

Analyse the impact and efficacy of the solution
- ✓ Experiment solutions in the field, monitor and examine the impact;
- ✓ collect bottom-up suggestions and ideas (children, school, parents);

Essential for long term behaviour change

S2HOES Toolkit

GAMIFICATION (playful approach)	APPLICAZIONE MOBILE (make life easier)

A class/school competition about sustainable mobility
KidsGoGreen launches a collaborative class/ school challenge about sustainable mobility, aimed at adding up the kilometers traveled collectively in a sustainable way to reach stopovers of a virtual journey that is linked to teaching activities.

A more participative, effective, dynamic management thanks to information technologies
The **Pedibus Smart** mobile app supports the traditional Pedibus by automatically registering the children who join, thus reducing the organizational effort of accompanying volunteers. This input can be (optionally) linked to **KidsGoGreen**.

S2HOES pilot schools

The S2HOES preliminary study involved the participation of **three pilot schools from Canton Ticino** in testing the two proposed IT solutions over a time period of 2 to 5 months (January – May 2021):

- **Balerna**
- **Novazzano**
- **Mendrisio**

Due to the COVID emergency 2020 (menacing continuously possible lockdowns), the choice of the **S2HOES-tools to be tested in the field** was left entirely to the discretion of each school board**, giving rise to a mixture of approaches:**
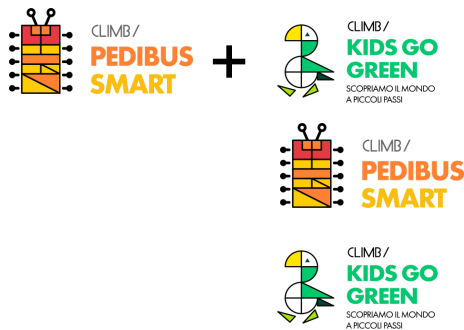
- G1 - Combined version of PBS and KGG

- G2 - Single version of PBS

- G3 - Single version of KGG

Three different types of intervention

G1: **Primary schools of** **Balerna and** **Novazzano**	**Group 1:** **Intervention group:** Combined version of PBS and KGG **Choice**: Joint together, as a self-reinforcing model; **Duration**: January – May 2021 (5 months)
G2: **Primary school of** **Mendrisio-Canavée**	**Group 2:** **Intervention group:** Single version of PBS **Choice:** Opted out of KGG, because of COVID time constraints of teachers **Duration:** March – May (3 months)
G3: **Kindergarten of** **Balerna, Novazzano,** **Mendrisio-Salorino,** **Mendrisio-Capolago**	**Group 3:** **Intervention group: Single version of KGG** **Choice:** Opted out of PBS, because they did not have a WSB initiative in place at the start of S2HOES **Duration - Balerna/Novazzano:** January – May (5 months) **Duration - Salorino/Capolago:** April – June (2 months)

Overview of the primary school and kindergarten classes involved in the S2HOES preliminary field study – school year 2020/21

School	School level	No. of classes	No. of pupils	S2HOES tool to be tested	Intervention group
Balerna	Primary (1st - 5th grade)	8	131		G1
	Kindergarten	4	83		G3
Novazzano	Primary (1st - 5th grade)	5	94		G1
	Kindergarten	3	48		G3
Mendrisio	Primary (1st - 5th grade)	16	300		G2
	Kindergarten	2	32		G3
Total	-	38	688	-	-

Pedibus Smart – mobile application and proximity device

| Primary school	Participation to the "Pedibus Smart" (PBS) scheme			
	No. of local PBS routes involved	No. of accompanying volunteers	No. of pupils joining PBS	% of PBS pupils / total school pupils
Balerna	3	6	38	29%
Novazzano	3	11	29	31%
Mendrisio	4	14	25	8%
Total	**10**	**31**	**92**	**18%**

<u>GENERAL INFORMATION about the Pedibus lines involved in this field study:</u>
Route frequency: once every two weeks
Size of Pedibus: approx. 5 to 12 children per route
School level: only primary schools
Participation rate: between 8% and 31%

14/10/2021
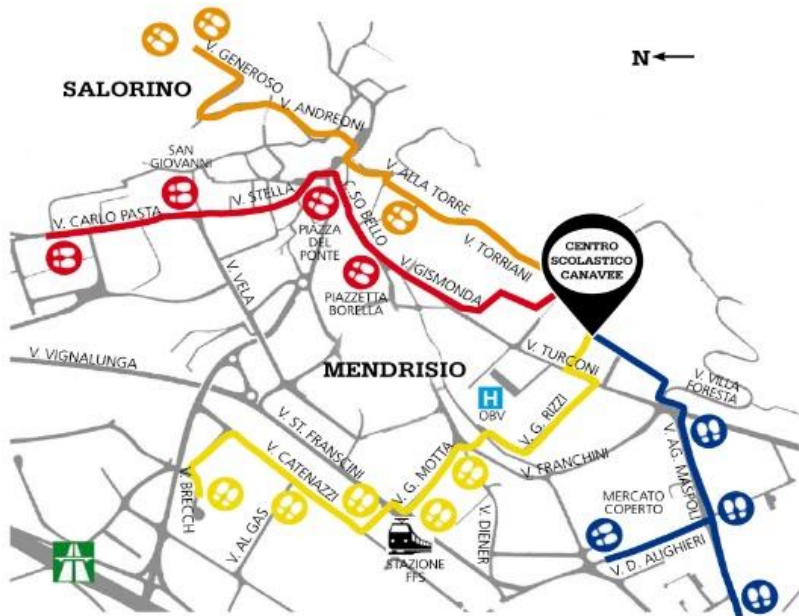
KidsGoGreen – a gamification approach

"Around the World in 80 Days"
(47'075 km in 14 stopovers)

Number of participants: 356 children
School: Primary school/Kindergarten Balerna and Novazzano
Duration: 18.01.21 until 31.05.2021

"Traveling with Azzurra and Celestino"
(1'700 km in 3 stopovers)

Number of participants: 18 children
School: Kindergarten of Mendrisio - Salorino
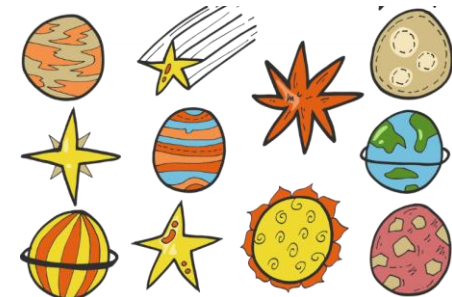**Duration:** 15.04.21 until 15.06.2021

"Traveling the Galaxy of Art"
(800 km in 8 stopovers)

Number of participants: 16 children
School: Kindergarten of Mendrisio - Capolago
Duration: 15.04.21 until 15.06.2021

A novelty: enrolment of kindergarten sections in KGG

• For kindergarten sections with no computer facilities, the digital «mobility logbook» was transformed into an «offline», paper version, based on an already existing proposal by ATA Pedibus;

• Coloured stickers are used and applied according to the mode of transport used;
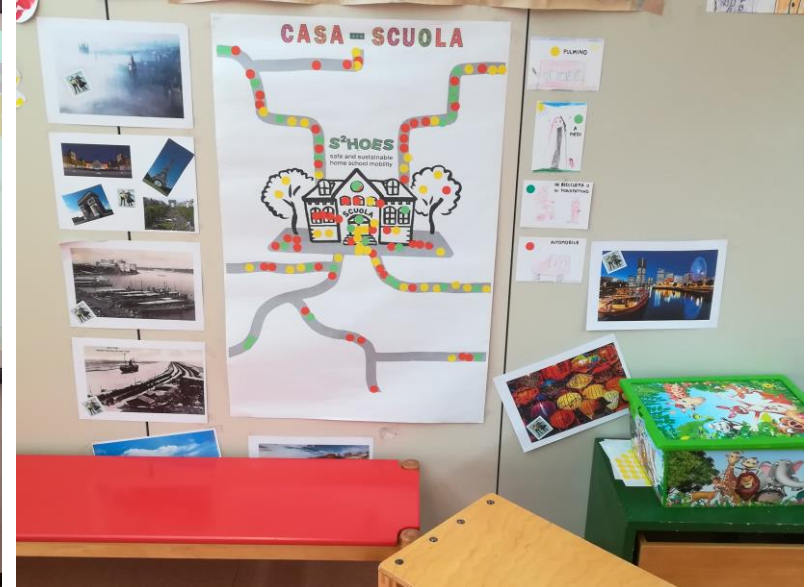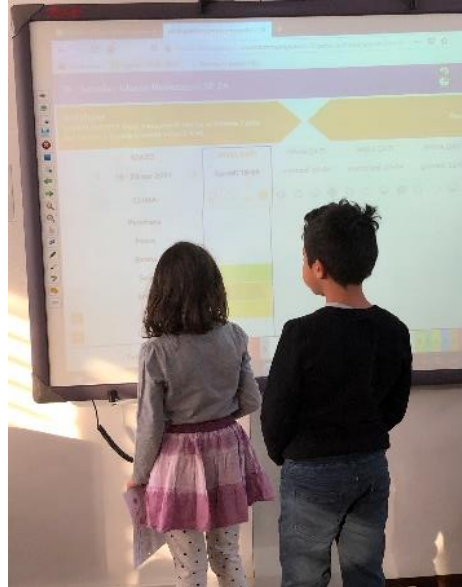
Impact assessment

- Launch of a **pre- and post-intervention survey** to evaluate efficacy**:**

  - ✓ **Questionnaire addressing parents**: parents are the ultimate decision-makers about the travel mode used by their children to reach school and represented the <u>main subject of investigation</u>;

  - ✓ **Questionnaire addressing school children:** only pupils experimenting the *combined* S2HOES version (PBS + KGG) were surveyed to gain insights from a child's perspective;

- Pseudonymized identification codes allowed **a comparative analysis *before* and *after* the intervention** to determine possible changes over time.

- Responses by parents and school children were **segmented and analysed according to the three intervention groups (G1, G2, G3)**;

Impact assessment (June – August 2021)

- **Main research topics of the survey:**

✓ General socio-demographic data

✓ School mobility patterns

✓ Traffic and road safety perception

✓ Attitude towards mobility issues

✓ Environmental awareness

✓ Social Factors

✓ Evaluation of the KGG scheme

✓ Evaluation of the PBS scheme
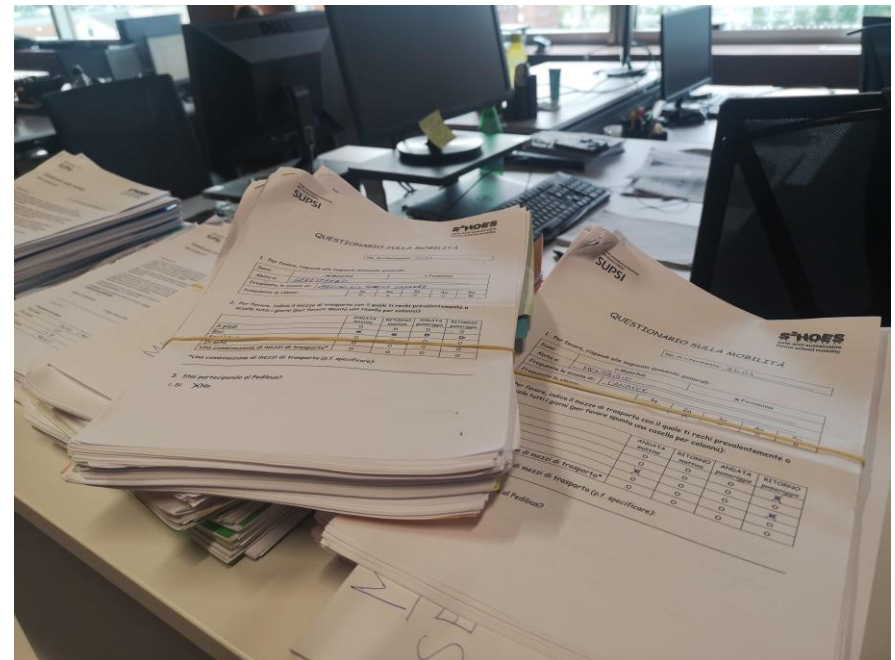
Pre- and post-intervention survey: response rates

Parents' response rate in numbers and percentages to the pre- (T1) and post-survey (T2).

| S2HOES Intervention type	Tot. no. parents	T1		T2		T1 + T2	
		No. of responses	Response rate	No. of responses	Response rate	No. of responses	Response rate
G1 (KGG + PBS)	225	219	97%	110	49%	104	46%
G2 (only PBS)	300	283	94%	63	21%	60	20%
G3 (only KGG)	163	116	71%	31	19%	27	17%
Total	**688**	**618**	**90%**	**204**	**30%**	**191**	**28%**

Schoolchildren's response rate in numbers and percentages to the pre- (T1) and post-survey (T2).

S2HOES Intervention type	Tot. no. of pupils	T1		T2		T1 + T2	
		No. of responses	Response rate	No. of responses	Response rate	No. of responses	Response rate
G1 (KGG + PBS)	225	217	96%	185	82%	181	80%

Responses emerging from the combined survey T1 + T2 are ultimately the data used for running a comparative analysis about the impact of the S2HOES intervention over time. Results follow.

# Results

G1 - Combined version of PBS and KGG
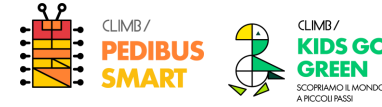
SCHOOL MOBILITY PATTERNS
- S2HOES positively affected school mobility behaviour;
- active mobility increased significantly versus motorised mobility;
- Parents' and children's ideal wish to use active transport to reach school undergoes a positive change;
- Schoolchildren evaluate more positively the impact of walking on the environment as a travel mode at the end of the intervention;

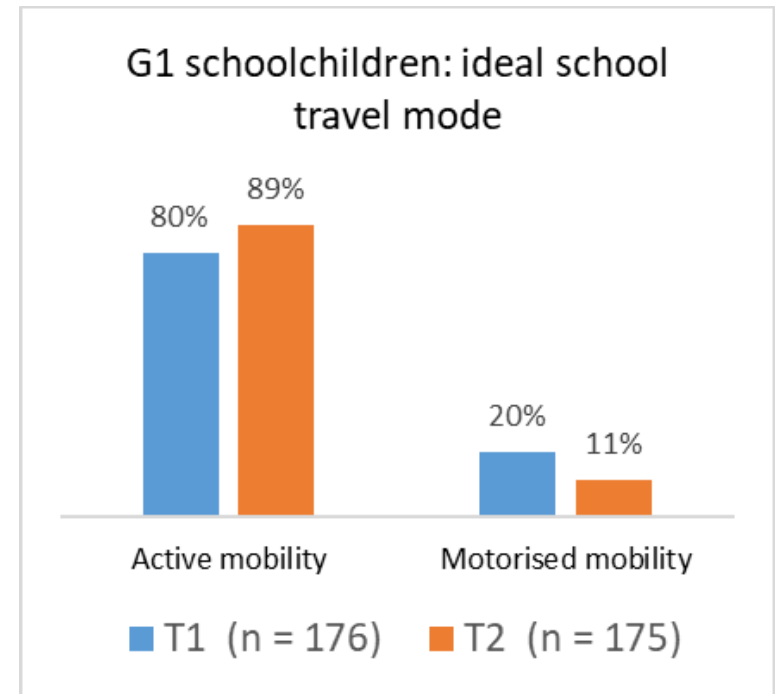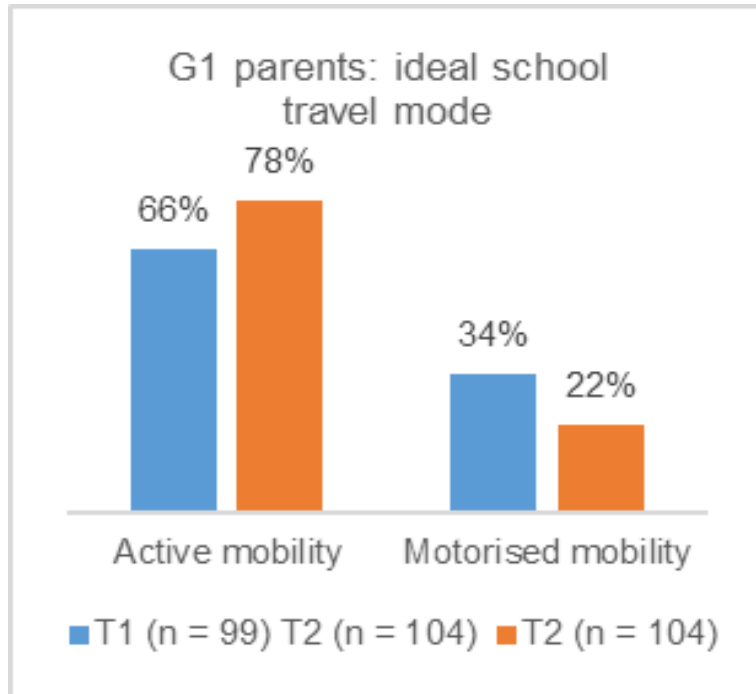**TRAFFIC AND ROAD SAFETY PERCEPTION**
- Parents feel reinsured about crossing roads safety at the end of the intervention;
- A specific safety concern about a dangerous local crossroad emerged thanks to the indications of parents;
- Bullying fears increase, as active mobility increases in the absence of adult supervision;

G1 - Combined version of PBS and KGG
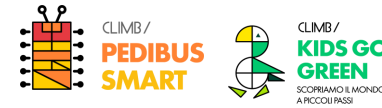
Dichotomized data for sample G1 shows an increase (12%) in parents considering active mobility the preferred travel mode for their child, shifting from 66% to 78%.

The sample reports a 9% increase in children considering active mobility their ideal school travel mode at the end of the intervention, shifting from 80% to 89%.

G1 parents: ideal school travel mode

66% 78%
34% 22%

Active mobility   Motorised mobility

■ T1 (n = 99) T2 (n = 104) ■ T2 (n = 104)

G1 schoolchildren: ideal school travel mode

80% 89%
20% 11%

Active mobility   Motorised mobility

■ T1 (n = 176) ■ T2 (n = 175)

G1 - Combined version of PBS and KGG

Evolution of the weekly number of home-school trips, by transport mode. Data visualized on a weekly base, shows clearly how active mobility increased over the intervention period, while motorized mobility decreased
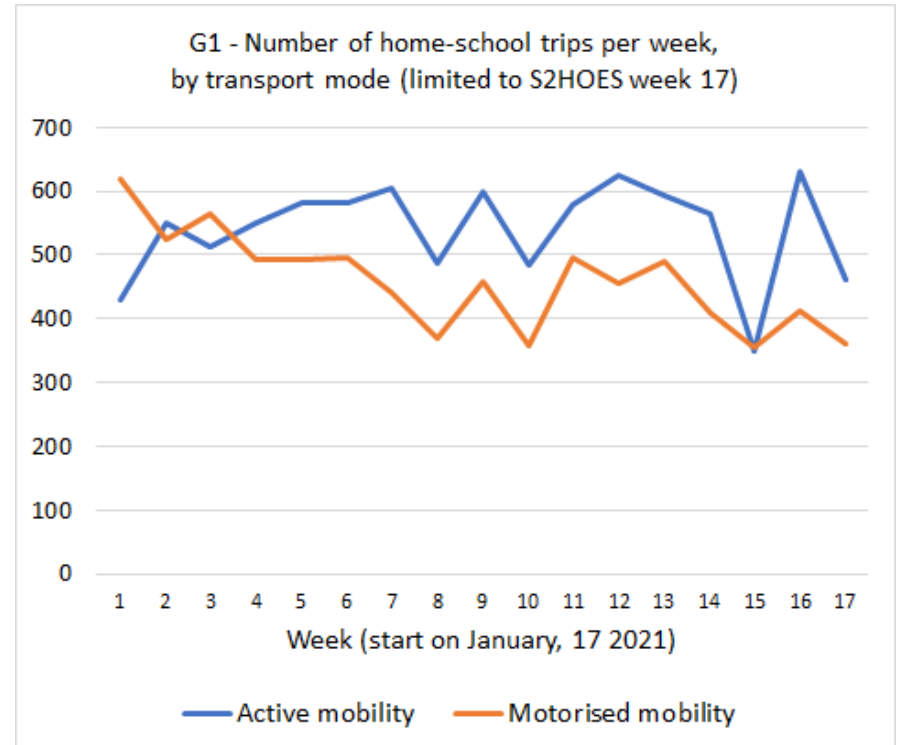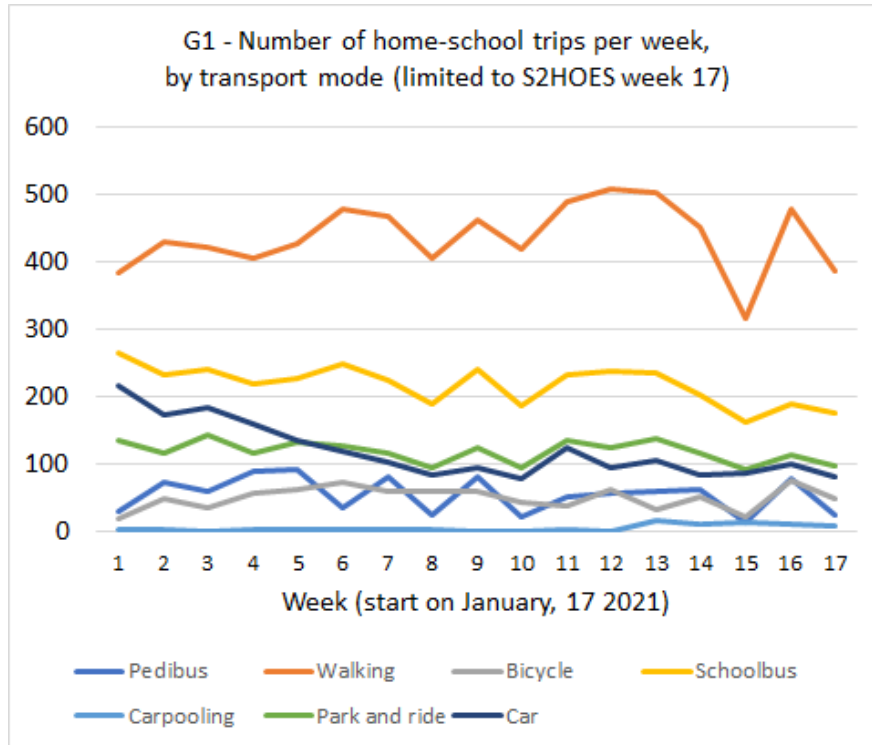
G1 - Combined version of PBS and KGG
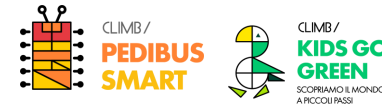
SOCIAL FACTORS
- No statistically significant change is reported in regards to parents' perceived «social support» by the school;
- Parents expressed the wish to improve project communication, as to become a more active part in the initiative;

PEDIBUS
- Contributed to a 10% increase of WSB/PBS participants (10 children; 3 volunteers);
- 74% of parents, whose child joined WSB/PBS, asserted the mobile app + device is an added value;

KIDSGOGREEN
- 74% of school children enjoyed using sustainable travel modes to reach school;
- Most liked KGG activity by children: reaching stopovers to discover contents;
- Parents agree KGG is innovative, stimulating and has positive impact on mobility;

84% of parents indicated to be very/very much satisfied about the S2HOES project.

G1 – Combined version of PBS and KGG

COLLABORATION WITH THE LOCAL PARENTS ASSOCIATIONS

Novazzano: In addition to organizing Pedibus Smart, the Parents' Association prepared "French crêpes" for the whole school as children reached the stopover in "Paris" (Travel around the world in 80 days).

Balerna: In addition to organizing Pedibus Smart, the Parents' Association prepared "English scones" for the whole school as children reached the stopover in "London" (Travel around the world in 80 days).
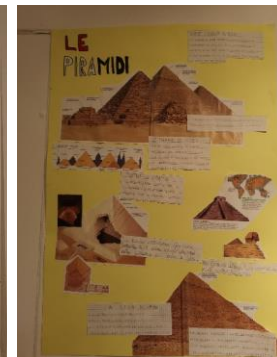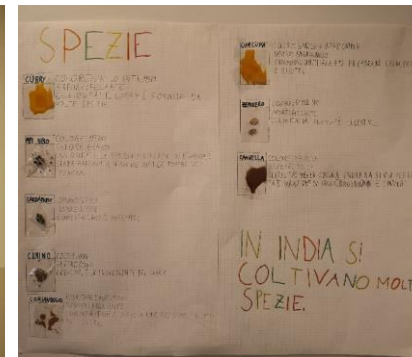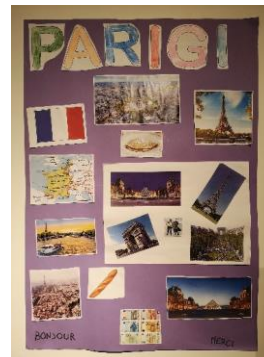
G1 –Combined version of PBS and KGG

FINAL EVENT: To reward the engagement of all participants, children received a visit by penguin "Pango", the Pedibus mascot, who gave all the children a S2HOES certificate and talked about the implications of climate change.

PROJECT EXHIBITION: Organized by the teaching staff in collaboration with the Parents' Association, the exhibition was an opportunity to recall all the stopovers reached during the virtual journey by travelling sustainably to school.

G1 - Combined version of PBS and KGG
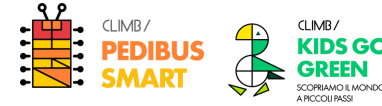
CONCLUSIONS
- The combined version (PBS + KGG) is an effective self-reinforcing model, successful and beneficial even in contexts where, for instance, local WSB initiatives are run only once every two weeks;
- Thanks to the S2HOES pilot project, a first, important awareness-raising work has been launched which has aroused in many parents interest in the topic and the wish to be more involved and informed;
- Communication and unity of purpose between parents and school are pivotal for reaching S2HOES' ultimate goal (a deeper change in school mobility practices) – a more pro-active drive in this context could be subject for future improvement.

G2 - Single version of PBS

CONTEXT
- the no. of pupils participating in the WSB/PBS scheme is rather low (8%), while the sample reports the largest no. of families living > 3 km from school (25%);
- the WSB/PBS initiative is run only once every two weeks, at lunchtime (low impact intervention);

SCHOOL MOBILITY PATTERNS
- Mobility-related behaviour *does not shift substantially* towards active mobility;
- Reaching school by bike/kick-scooter decreases, as well as by car;
- Parent's ideal school travel mode for their child, if given the choice, *does not shift* in favour of active mobility;

TRAFFIC AND ROAD SAFETY PERCEPTION
- Parents' fears about traffic danger in front of the school decrease;
- Parents' perception that cars are the safest travel mode to school, increases;
- Parents' perception that their child is not self-sufficient to travel alone, increases;

G2 - Single version of PBS

PEDIBUS

- no increment in the WSB/PBS initiative was registered, but participation was maintained rather steady;
- 80% of parents, whose child participated in the WSB/PBS scheme, asserted that the mobile app " proximity device represent an added value;
- 50% of those parents who did not register their child to the WSB/PBS scheme indicated the absence of a WSB route close to where they live as a main reason;

CONCLUSIONS

- Inconsistency of findings: parents' increased perception that cars are the safest travel mode to school and that children are not yet self-sufficient to travel alone, contrasts with parents' responses about the most frequently transport mode used by their child to reach school, which registers a decrease in private car use;

- In the absence of more solid, daily and verifiable data on travel modes actually used to reach school, interpretation becomes difficult - daily data registration (e.g. the "mobility logbook" used in KGG) could be a useful tool for exploring dynamics related to school mobility;

- There is a potential for improvement in the extension of WSB routes in Mendrisio city;

G2 – Single version of PBS

Pedibus/Pedibus Smart initiative at the primary school of «Centro scolastico Canavée», Mendrisio city.

G3 - Single version of KGG

CONTEXT
- Kindergarten children are prevalently not yet self-sufficient to travel alone;
- Highly motorised context: 48% of families lack or have low access to a school bus service and thus drive their child to kindergarten (37%);
- Car mobility seems to represent in many cases an *"obvious and only choice"*;

SCHOOL MOBILITY PATTERNS
- Mobility-related behaviour *does not shift substantially* towards active mobility;
- Parent's ideal school travel mode for their child, if given the choice, *does not shift* in favour of active mobility;

TRAFFIC AND ROAD SAFETY PERCEPTION
- G3 reports highest concerns about traffic danger compared to G1 and G2;
- Parents experience a statistically significant *increment in the perception that the car is a viable solution* at the end of the intervention*;*

G3 - Single version of KGG

SOCIAL FACTORS

- Parents experience a statistically significant *decrease* in perceived «social support» by the school;

CONCLUSIONS

Proposing *only* KGG to change mobility-related behaviour in a highly motorized context, involving children that are not yet self-sufficient to travel alone and have also limited narrative skills, seems to cause:

- Parents to feel they're not backed up by the school, either because no valid and safe alternative solution to motorised mobility is offered (i.e. a WSB/PBS initiative), or else, because of a lack of communication/ incongruence in the unity of intent between the school and the parents;
- Parents to reaffirm their perception that the car is a feasible (only?) solution;
- Possible threats: if words are not followed by facts, school's efforts in promoting safe and sustainable school mobility may be discredited;

G3 – Single version of KGG
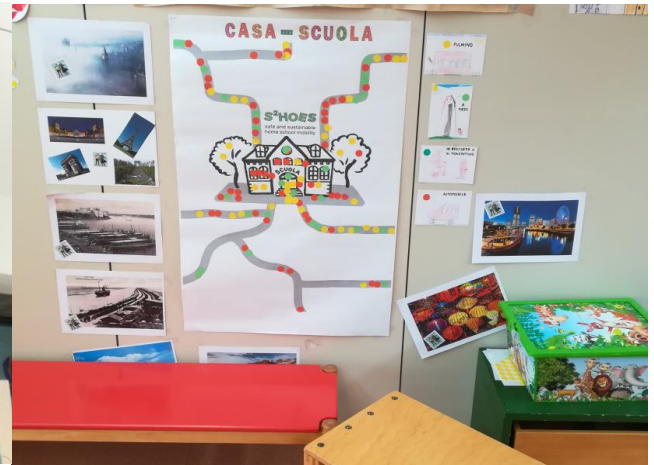
Some KGG activites run with kindergarten children from Balerna, Novazzano, Salorino, Capolago.

G3 - Single version of KGG

A POSITIVE RESULT

- The parents association of Balerna expressed the will **to create a new WSB/PBS initiative** targeting specifically **kindergarten children** and run **on a daily basis, starting the school year 2021/22.**

Raccommendations for KidsGoGreen (KGG)

- Re-design the "mobility logbook", emerging as the less engaging activity for children, as to improve user experience;

- Find new ways to increase engagement of parents/families KGG (e.g., through sustainable mobility challenges in weekends/holidays) and extend the positive impact also on free time and leisure trips;

- Enable a wider adoption of KGG by improving the existing digital tools to make teachers more autonomous in the various preparatory and conduction activities;

- Further support teachers in pro-actively promoting S2HOES' problem-solving approach, bridging increased environmental awareness with action for change;

- At kindergarten level, ensure the implementation of KGG is coupled with *action for change* (e.g. joining WSB/PBS initiative), to impact families' mobility-related behaviour effectively.

Raccommendations for Pedibus Smart (PBS)

Currently the PBS scheme is more useful for larger and/or more frequent WSB initiatives and parents do not benefit directly from it:
- Customize the app to fit smaller initiatives (e.g. Ticino Pedibus) and support the expansion in the no. of days active, volunteer scheduling, communications;
- Involve parents in the evaluation and enhancement as to fit also parents' needs and interests;

Improve communication on:
- Functioning, scope of the proximity device and personal data protection;
- Benefits of collecting automated data for local school mobility management (municipalities, school, associations)

The S2HOES project team

Roberta Castri
ISAAC-SUPSI

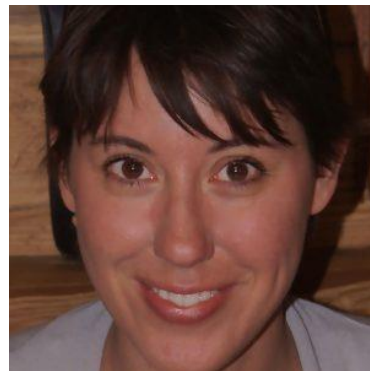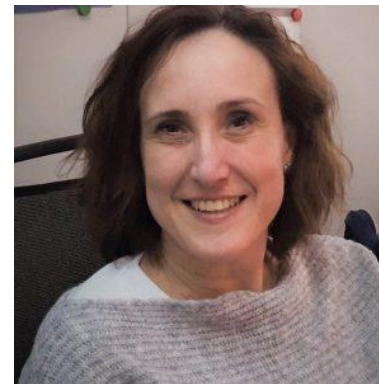Francesca Cellina
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FBK – PBS

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