

## Comparative International Area Studies - Team 3

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### <Living Lab for Children's Traffic Accidents in School Zones>

## 1. Problem recognition and analysis

### 1) Problem recognition

-Children's traffic accidents in \*school zones (child protection zones) in Korea are on the decline overall, but accidents continue to occur in school zones where children's safety is a top priority, so we feel the need to solve the problem.

\*School zones are designated not only around schools but also around private academies, typically within a radius of 300 meters.

Status of Child Traffic Accidents in School Zones															
sort	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
accidents (cases)	535	733	751	511	427	523	541	480	479	435	567	483	523	514	486
Deaths (persons)	7	9	10	6	6	4	8	8	8	3	6	3	2	3	2
Injuries (persons)	560	760	783	528	438	553	558	510	487	473	589	507	563	529	523

Source: Korean National Police Agency

-The Korean government implements various policies to reduce children's traffic accidents in school zones

e.g.) Installation of safety facilities such as yellow carpets, guardrails, and speed bumps, a crackdown on illegal parking and increase of fines, implementation of safety education, and

\*\*Min-sik Law enacted.

\*\*Min-sik Law aimed at enhancing child safety in school zones by imposing stricter penalties for traffic violations, mandating the installation of safety devices, enforcing lower speed limits, and increasing surveillance.

## **2) Problem Analysis**

### **-The patterns of children's traffic accidents:**

·Accidents occur frequently between 14:00 and 18:00-It is the time when children return home from school or go to academies

·70% of the deaths are first and second graders; 76% of the whole accidents occur during the crossing - 66.3% of 77.6% occur within the crosswalk and 33.7% occur outside the crosswalk.

### **-The Causes of children's traffic accidents:**

#### **-Lack of safety facilities:**

Lack of safety facilities suitable for the characteristics of the road, ambiguous markings of school zones, and insufficient warning facilities; overspeed bumps, crackdown CCTV, etc.

#### **-Characteristics of children's behavior and psychology:**

sudden impulsive behavior, and the mistaken belief that if they recognize the driver, the driver will also recognize them.

#### **-Driver negligence:**

speeding, careless, illegal parking, drunk driving, etc.

## **2. Solution to the problem**

### **1) Installation of Parking Facilities to Prevent Illegal Parking:**

According to a 2024 article, the proportion of traffic accidents caused by illegal parking in school zones is close to 38%. The accident occurs when a small child, hidden between illegally parked cars, suddenly darts out without being able to see the surrounding area.



A picture of a child traffic accident by illegal parking



A picture of a folding barricade

->**Solution:** The issue of illegal parking arises due to a lack of parking facilities, and children's traffic accidents occur when children suddenly dart out from the gap of illegally parked cars. To address both problems simultaneously, we planned to install parking facilities in areas that do not obstruct traffic. These parking facilities will employ the principle of folding barricades to eliminate gaps between vehicles.

->**However,** due to the lack of consideration of fundamental problems and the difficulty of implementing solutions at the citizen level, alternative measures have been devised.

## 2-1) Limiting Driving Speed Within and Around School Zones by a \*telemetry

\*Telemetry is the real-time transmission of data from the car to the observer. It is widely used in F1. It provides information including the speed and location of the car.



-> A picture of telemetry being used during an F1 race



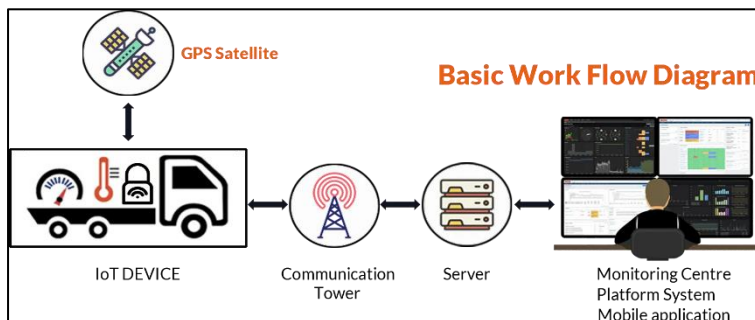
-> An example of a telemetry

-**Inspired by F1**, we planned to use this technology to monitor and penalize speeding. This is for addressing the current insufficiency in school zone enforcement and preventing drivers from speeding/speeding and then sudden deceleration to avoid a speed trap.

-> **However**, since this method is a government-led, surveillance-based solution rather than a living lab, we aim to devise a user-driven solution that focuses on 'speed limitation' without requiring government intervention or regulation.

## 2-2) Limiting Driving Speed Within and Around School Zones by a \*speed limiter

\* A speed limiter is a device that forcibly limits the speed of a vehicle. This device restricts the vehicle from driving above a set speed in specific zones or situations. For example, if the speed limiter is set to 30 km/h, the driver cannot drive at a speed higher than that.



-> The picture shows the process of using a speed limiter



-> An example of a speed limiter

-**The speed limiter** supplements the limitations of telemetry by -- **firstly**, forcibly limiting the speed of the vehicle, not just monitoring; **secondly**, ensuring that drivers are fully aware that they are in a school zone through information delivery functions, and providing warnings when the speed limit is exceeded or attempted to be exceeded; **thirdly**, tracking the number of speeding attempts in specific areas in school zones using paddle signal controls and GPS which offers valuable feedback for future safety facility installations; and **lastly**, facilitating easy transmission, collection, and storage of data, which helps observers.

### 3. Experimental Design

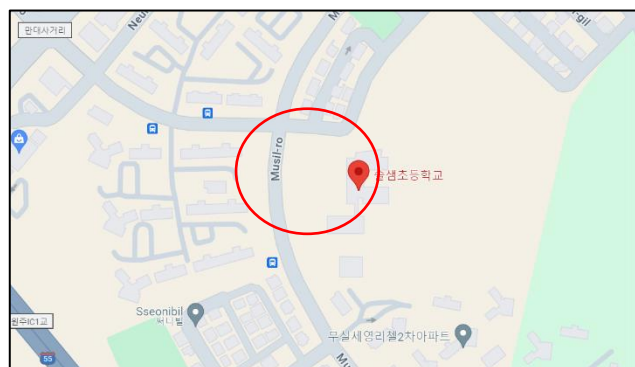
<Main purpose of the experiment: 1. To improve drivers' clear awareness of school zones, 2. To identify the direct impact of speed limits on the reduction of children's traffic accidents in school zones>

#### 1) Before the experiment

·**Recruitment of participants:** The participants will be the ones who have been caught in the crackdown in school zones, or who voluntarily want to participate. (A minimum of 8 participants and a maximum of 16 participants will be needed)

-We will survey participants before and after the experiment. This is for checking the change in the perception of participants while they drive in school zones.

·**Pre-checking the experiment site:** We chose Solsaem Elementary School in Wonju as a site for the experiment. Musil-dong, where the school is located, is one of the areas where traffic accidents occur the most. We will visit the site to set up where to experiment and will check any possibilities of safety issues.



-> The red circle indicates the school zone of Solsaem Elementary School

·**Budget:** a speed-limiter of HBO-IOT company costs about 140\$, and the installation cost (labor cost) is about 36\$. If the number of participants is at least 8, about 1430\$ is expected to be required as a budget.

## **2) During the experiment**

-Each participants will conduct two experimental drives at the restricted speed of 30 km/h near and within the school zone.

-The detailed location for the experiment is set within a 150-meter radius (including entry/exit) of the Solsaem Elementary School's school zone. The experiment will take place during 2 PM to 6 PM, which is the time when the highest number of children's traffic accidents occur. The experiment will be conducted in 30-minute intervals (2:00-2:30, 2:30-3:00, etc.).

-Participants must verify whether the signals are functioning correctly when approaching and entering/exiting the school zone, as well as when nearing the speed limit. Additionally, the experiment designers must continuously monitor the GPS signal reception status to ensure it is functioning properly while participants are driving.

## **3) After the experiment**

-We plan to conduct in-depth interviews and surveys to assess changes in participants' perceptions. The main contents of in-depth interviews and surveys are **1.** Whether the speed limiter functioned properly, **2.** Whether the alarm system operated correctly, **3.** Whether the presence of the speed limiter significantly influenced driving habits, **4.** Whether the likelihood of safe driving increased, **5.** Whether there is a significant difference between the existing school zone warning signs and the in-vehicle notification system of the speed limiter.

#### 4. Expected Experimental Results

1) **(Before)** Difficulty in recognizing school zones due to insufficient/ineffective information signs for drivers -> **(Solution)** Provide drivers signals near the school zones/at the start of the school zones/at the end of the school zones -> **(After)** Reduction of children traffic accidents in school zones by drivers' clear awareness and safe driving

2) **(Before)** Speeding in school zones including speeding and then sudden deceleration to avoid a speed trap -> **(Solution)** using a speed limiter -> **(After)** Reduction of children's traffic accidents by driving safely below the speed limit

#### 5. Implications and Limitations

1) **The necessity of a phased implementation of solutions:** since the installation of the device (a speed limiter) and the enforcement of speed limits are required, it is necessary to gradually expand the scope of the application rather than implement it for everyone at once.




2) **Preparations for unexpected situations:** Forcibly limiting speed can cause problems in emergencies. Therefore, it is essential to install a device that allows for the temporary deactivation of the speed limiter. To prevent misuse, subsequent measures such as reporting local police stations or imposing fines can be implemented as corrective actions.

3) **Potential Reduced Effectiveness of the Experiment Due to Limitations of the Test Area (Solsaem Elementary School):** While Solsaem Elementary School is a high-traffic accident area, the number of child traffic accidents within the school zone itself is relatively low. Therefore, to ensure the effectiveness of the experiment, it should be conducted in other regions in addition to Wonju.

**4) Remaining issues of child traffic accidents:** Children's traffic accidents are more occurring outside of school zones. There are also remaining problems that cannot be solved only by the driver's safe driving. Therefore, we must continuously research and propose solutions to the issue.

## 6. Conclusion and Implications at the Global level

### 1) Associations with SDGs

 <p><b>3</b> GOOD HEALTH AND WELL-BEING</p>	<p><b>3.6</b> By 2020, halve the number of global deaths and injuries from road traffic accidents.</p>
 <p><b>4</b> QUALITY EDUCATION</p>	<p><b>4.a</b> Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.</p>
 <p><b>11</b> SUSTAINABLE CITIES AND COMMUNITIES</p>	<p><b>11.3</b> By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.</p>

-> We believe that preventing child traffic accidents through speed limitations can lead to the creation of a safe learning environment and the development of a livable urban environment.

### 2) The Implications of this Living Lab Project at the Global (Glocal) level

-South Korea has reduced the number of child traffic accident fatalities to 1/20th over the past 20 years. As of 2020, the number of child traffic accident fatalities per OECD country is 0.4, which is 0.4 lower than the OECD average of 0.8. Private companies also continue to implement child traffic accident prevention projects in other countries.



Therefore, if this experiment leads to meaningful results, it will be possible to help and cooperate with other countries at the citizen level, rather than at the government or corporate level.



**A picture of KB Insurance delivers helmets to vulnerable children and adolescents in Indonesia.**