

## Introduction

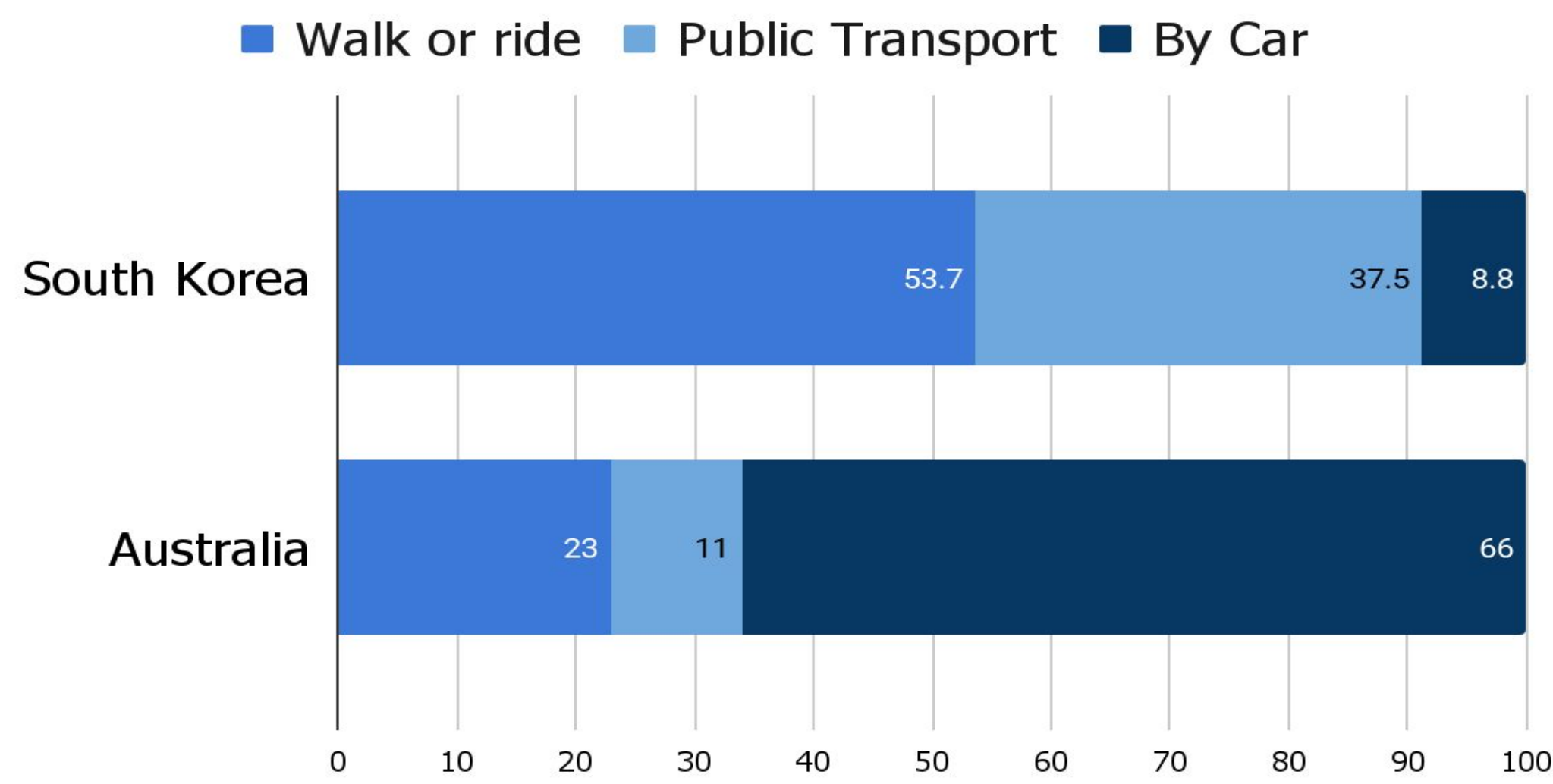


Fig 1. School Commute Methods of Elementary Students in Australia and South Korea

- 70% of child traffic accidents occur on the way home from school, primarily when children are commuting alone.
- This study identifies key factors influencing child traffic accidents and suggests measures to improve safety.

## Proposed Methods

### 1. Analysis of Child Traffic Accident Rates

$$\text{Accident Rate} = \frac{\text{Number of Accidents}}{\text{Number of Children}} \times 100 \quad (1)$$

- Collected traffic accident statistics involving children in Seoul.
- Compared accident frequency across different administrative districts.

### 2. Selection of Regions for Comparison

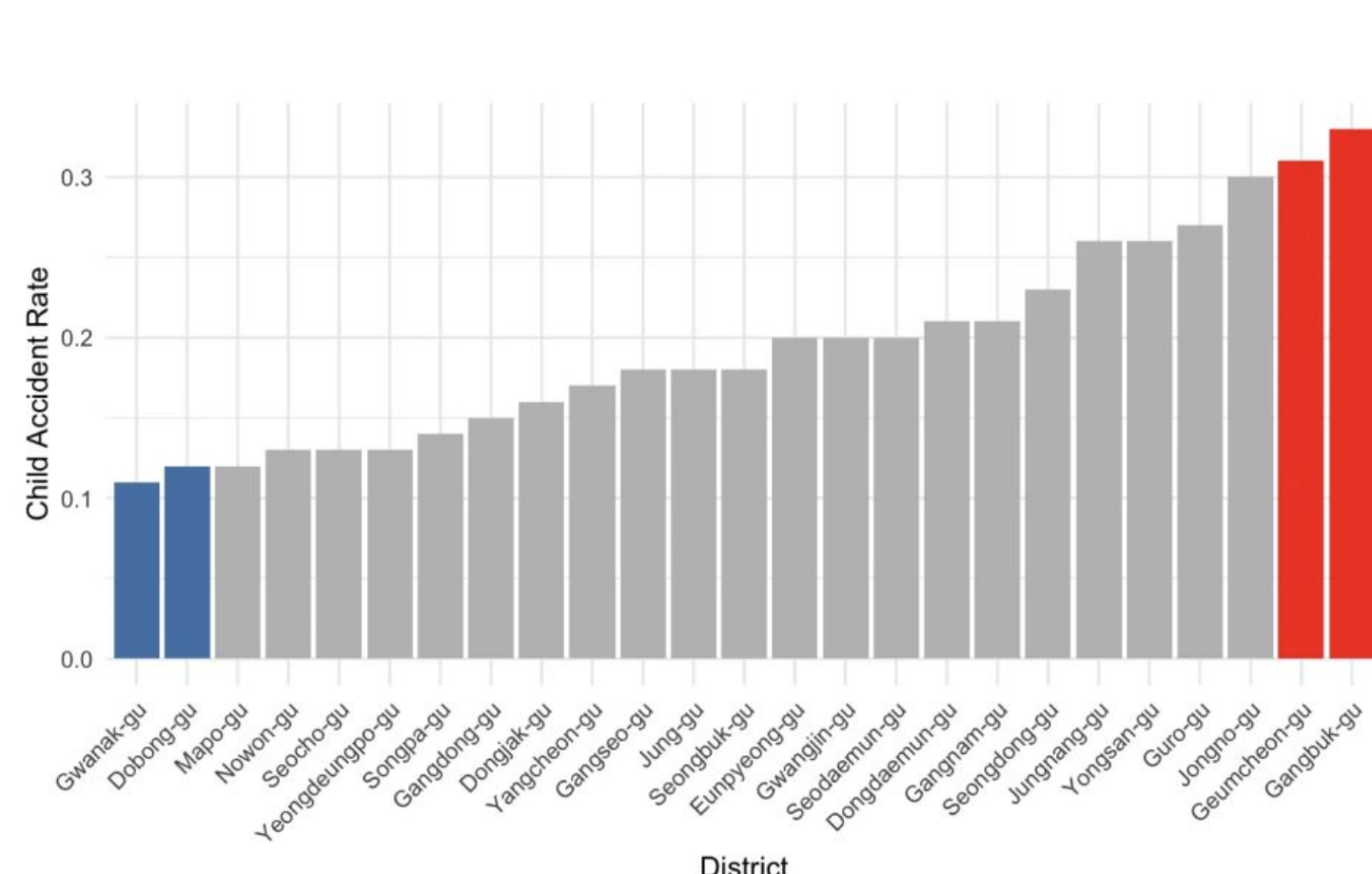


Fig 2. Graph of Accident Rate per Child Population

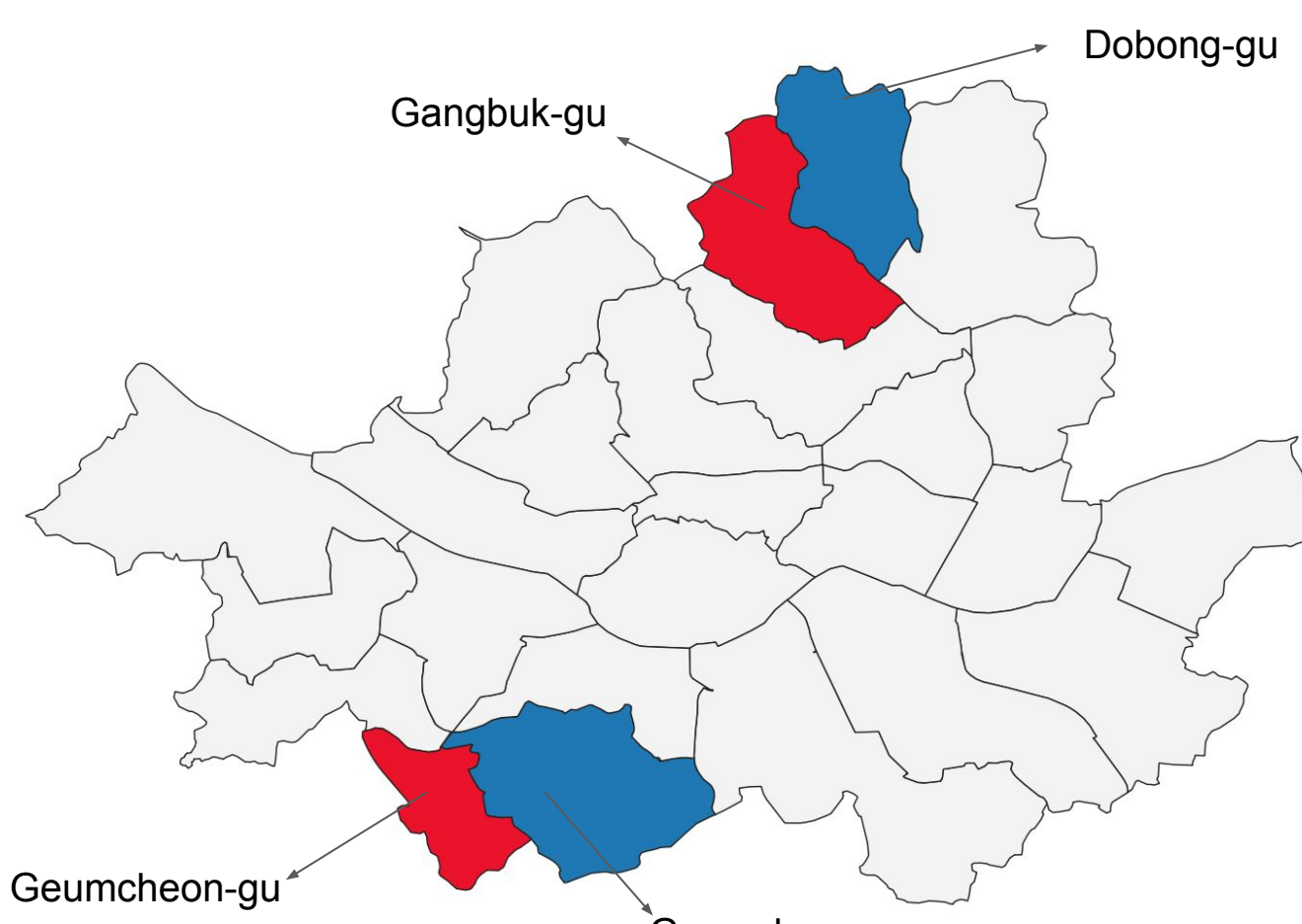


Fig 3. Top & Bottom 2 Regions by Accident Rate

- High-accident areas:** Gwanak-gu, Geumcheon-gu
- Low-accident areas:** Gangbuk-gu, Dobong-gu

### 3. Investigation of Contributing Factors

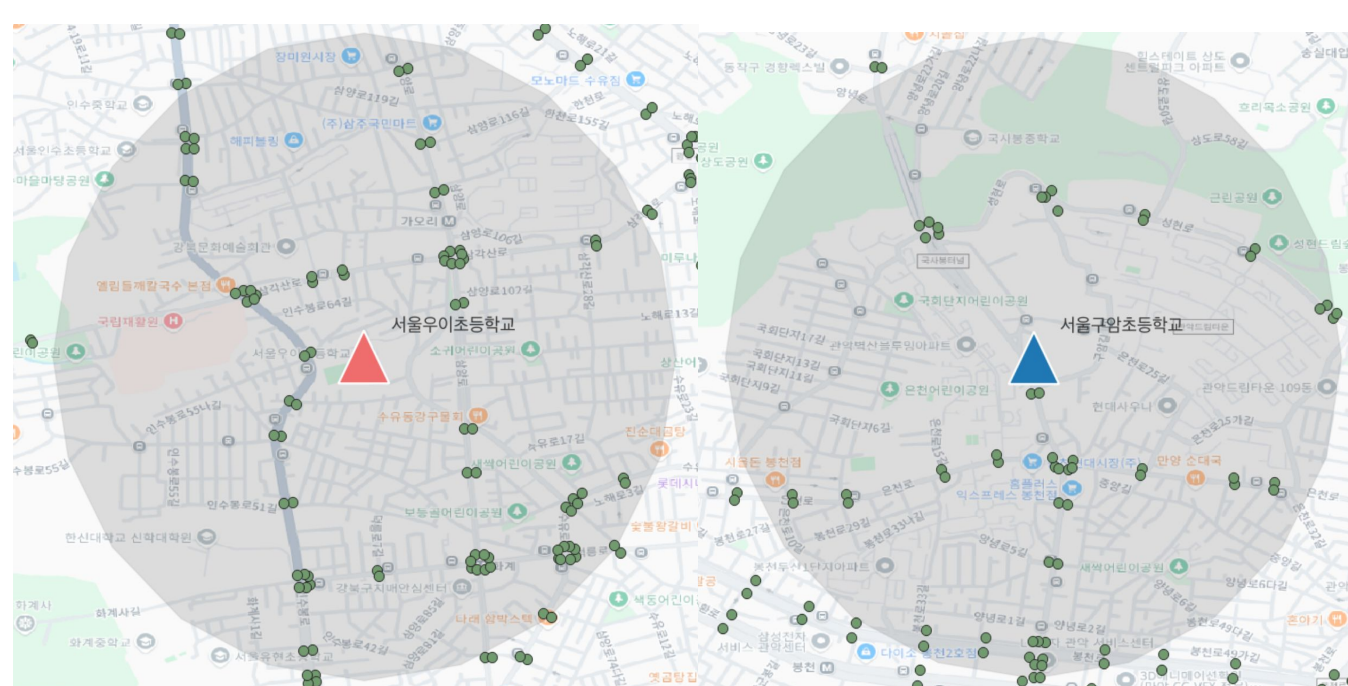


Fig 4. Crosswalks within a 700m Radius of the School



Fig 5. Illegal Parking within a 700m Radius of the School

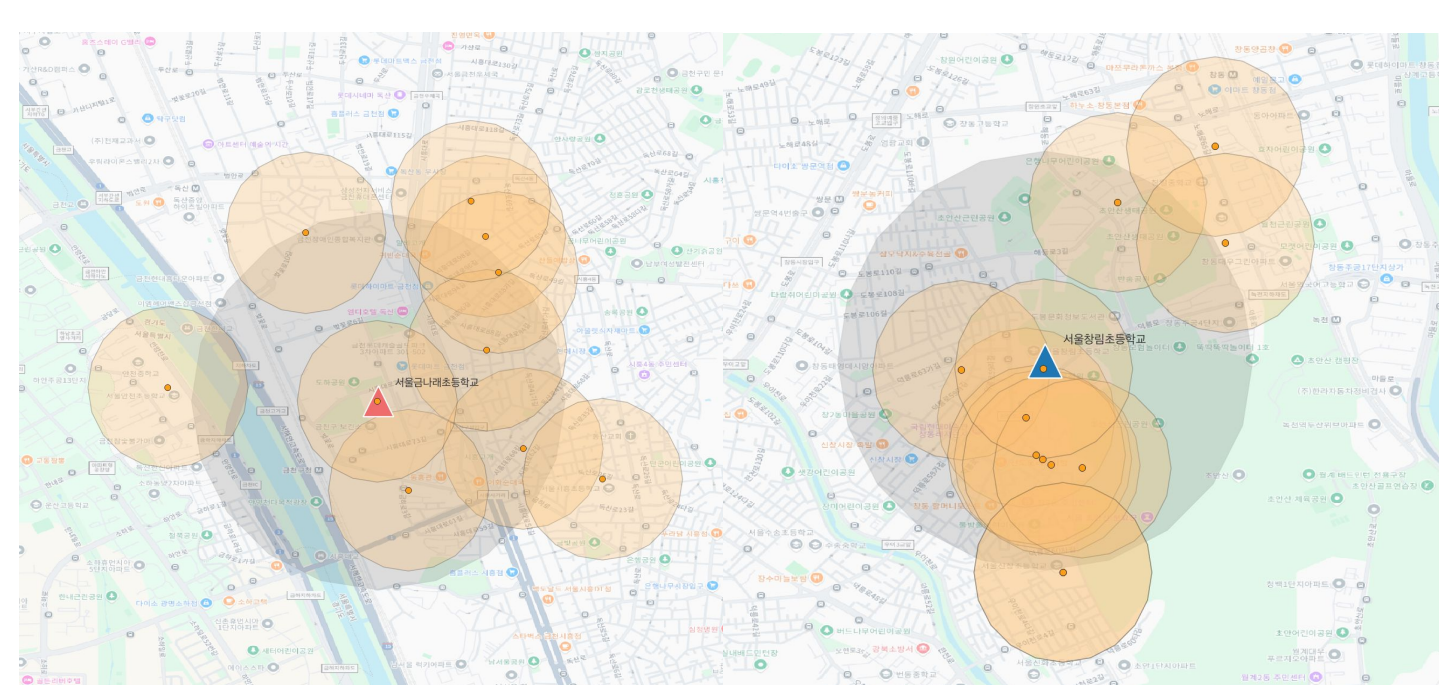


Fig 6. School Zones within a 700m Radius of the School

- Crosswalk Density:** Number of crosswalks within a 700m radius.
- School Zone Coverage:** Presence of designated child protection areas.
- Illegal Parking Incidents:** Frequency of violations near schools.

School	Number of crosswalks	Number of school zones	Number of illegal parkings
High-A	56	6	18,143
High-B	34	8	10,738
Low-A	39	11	11,105
Low-B	15	11	11,673

Table 1. Number of Facilities Within the Average Commuting Distance

## Experiment Results

### 1. Crosswalks & Accident Risks

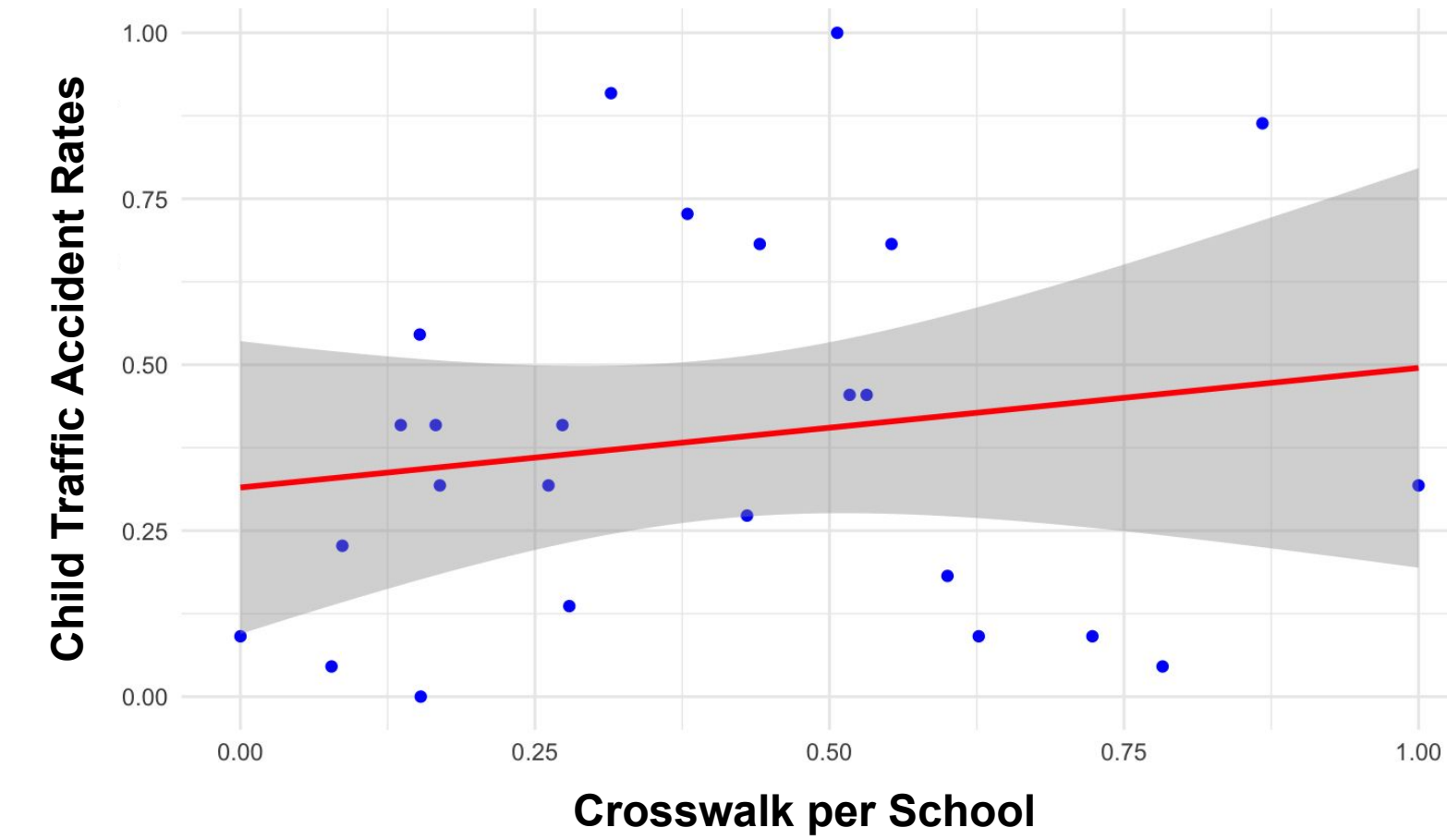


Fig 7. Linear Regression of Crosswalks

Excessive crosswalk density may increase confusion and risk for children.

### 2. School Zones & Safety

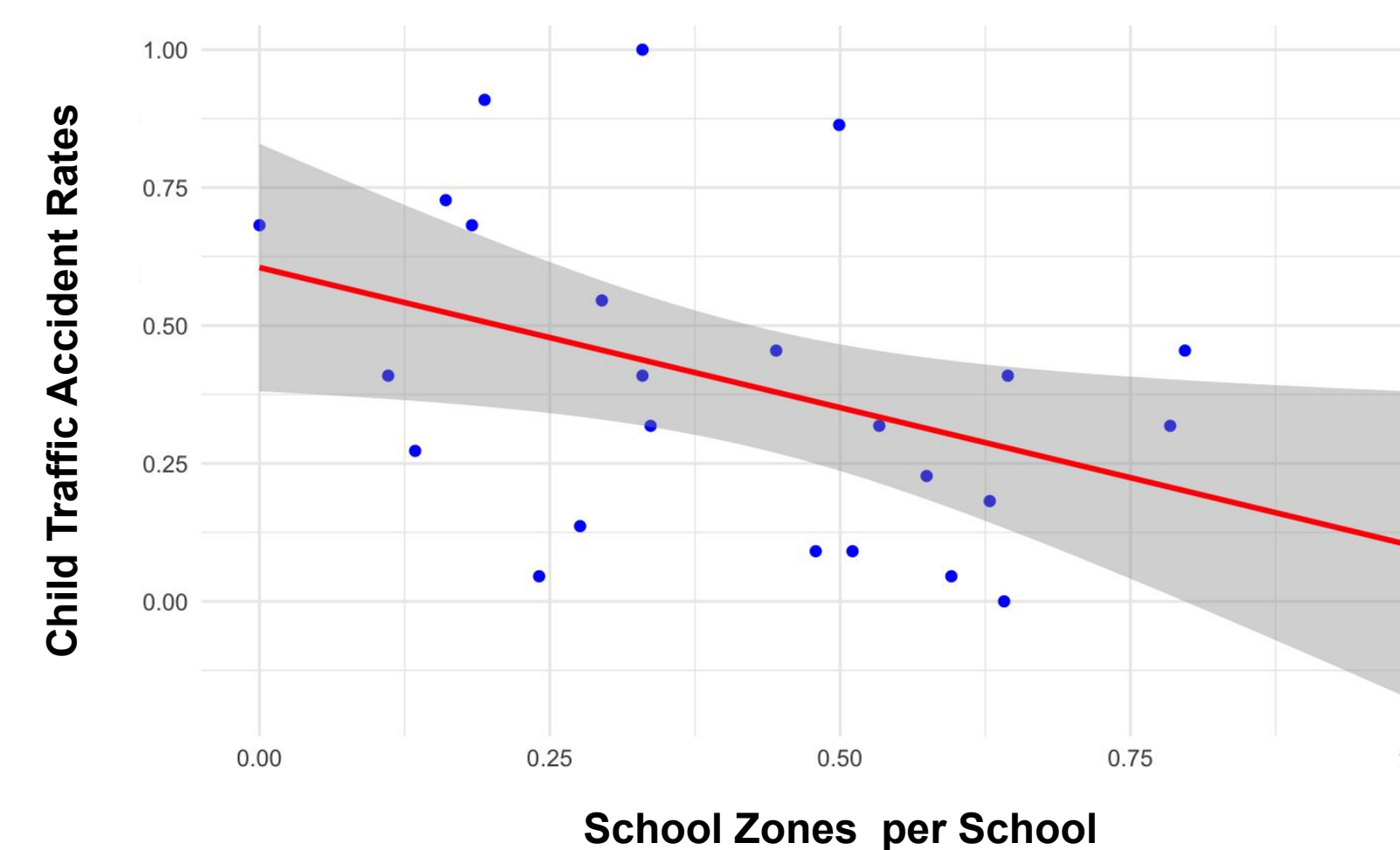


Fig 8. Linear Regression of School Zones

Effective speed limit enforcement in school zones correlated with fewer accidents.

### 3. Illegal Parkings & Accident Risks

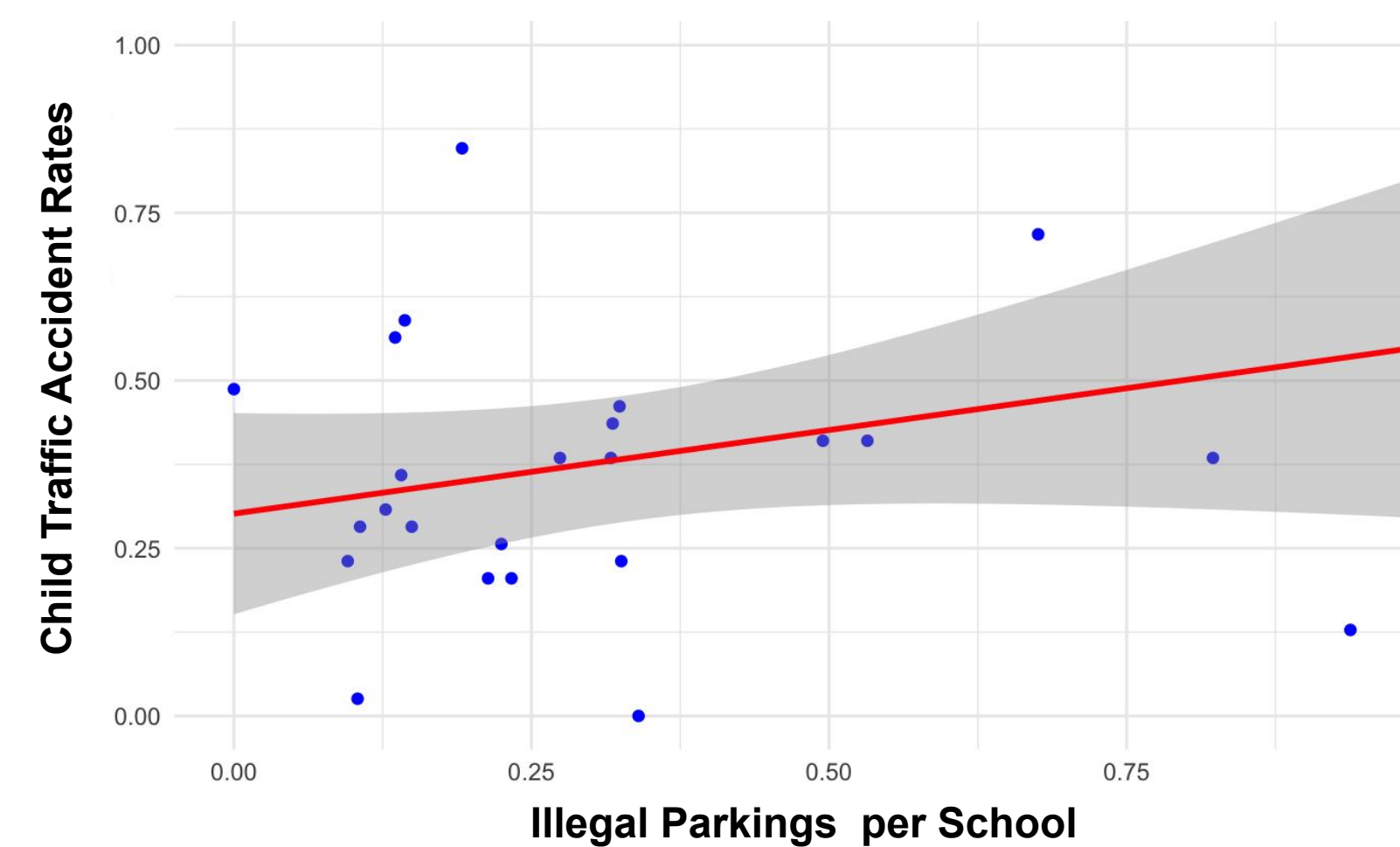


Fig 9. Linear Regression of Illegal Parkings

40% of school zone pedestrian accidents are related to illegal parking [2]. Schools near large residential complexes with sufficient parking have fewer violations, reducing accident rates.

## Conclusion

- Reevaluating Crosswalk Placement:** Strategic placement is necessary to balance safety and efficiency.
- Enhancing School Zone Effectiveness:** Strengthen enforcement of speed limits and driver awareness
- Reducing Illegal Parking:** Urban planning should include proper parking facilities near schools
- Technology Integration:** Use AI, drones, and smart traffic management to assist child pedestrian safety

## References

- T. H. Kim, S. H. Kim, and S. I. Lee, "A Empirical Study on Influence of Safety on Elementary School Road Considering Commuting Distance & Mode Type," *Journal of the Korean Society of Safety*, vol. 30, no. 6, pp. 139-147, Dec. 2015. DOI: [10.14346/JKOSOS.2015.30.6.139](https://doi.org/10.14346/JKOSOS.2015.30.6.139).
- Samsung Traffic Safety Research Institute, "Analysis of Causes and Prevention Measures for Pedestrian Accidents in School Zones," Press Release, May 3, 2024.