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## Drop-off and Pick-up Zone in Selected Primary School in Selangor

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### Abstract

Statistics from Royal Malaysian Police (RMP) show that there were 259 accidents that occurred in school areas. One of the facilities to improve school children safety in school area is drop-off and pick-up zone. Drop-off and pick-up zone in school zone is defined as an area beyond the road reserve or within the school boundary that is dedicated for dropping off and picking up school children by private vehicles, vans and school buses. The study objectives are to identify the availability of designated Drop-Off and Pick-Up (D&P), to assess the utilization of designated D&P and to determine the trend of dropping off student within the selected primary school zone in Selangor. From the study it was found that out of 30 schools, D&P are only available at 11 schools. In terms of utilization of D&P at these schools, 52% of the observed school children used this facility. At school with D&P also the remaining school children were picked up by their vehicles outside the D&P area with 31% at nearside of the school and 17% at the far side of the school. In this study, it shows that the D&P utilization for dropping and picking up school children can be further increase if parents/bus drivers do not wait in D&P. With the high and the effective D&P utilization, it will lower the risk of school children involved in an accident while crossing the road.

**Keywords:** School, Children, Safety, Drop-Off, Pick-Up.

### Introduction

The increase in the number of road accidents among the school children raised concerns by parents, especially when children are out of their supervision. A total of 85% of the overall primary and secondary schools in Malaysia were found to be at high risk because the students are exposed to road accidents (Utusan Malaysia, 2009). The risk will increase if the schools are located near the main road where the high traffic flow can cause the student more prone to accidents as evidently shown in Table 1. Statistics from Royal Malaysian Police (RMP) show that there were 228 accidents that occurred in school areas. One of the facilities to improve school children safety in school area is drop-off and pick-up zone. Drop-off and pick-up zone in school zone is defined as an area beyond the road reserve or within the school boundary that is dedicated for dropping off and picking up school children by private vehicles, vans and school buses.

The study objectives are to identify the availability of designated Drop-Off and Pick-Up (D&P), to assess the utilization of designated D&P and to determine the trend of dropping off student within the selected primary school zone in Selangor.

**Table 1. Road crash by area type**

Type of area	Type of road accident			
	Fatal	Serious	Minor	Total
Residential	513	262	416	1,191
Office	67	50	70	187
Shopping	147	104	224	475
Industrial/Construction	225	66	94	385
Bridge/Foot bridge	127	35	83	245
School	70	72	117	259
Others	5,421	2,889	4,523	12,833
Total	6,570	3,478	5,527	15,575

#### **Safety effect of Drop-off and Pick-up Zone**

The built environment of urban areas can have a strong impact on traffic safety. Wide arterial roadways which are common in suburban areas of North American cities, arterial-oriented commercial developments and big box stores have been associated with increased incidences of collisions and injuries (Dumbaugh & Rae, 2009).

A study in Baltimore, Clifton and Kreamer-Fults (2007) carried out a study to identify relationships between the built environment and pedestrian crashes. The study used presence of a driveway for student drop-off, presence of recreational facilities, presence of off-street parking, and presence of school set back from the road as variable for built environment. Other road characteristics such as road width, posted speed limit, and traffic volumes were also used in this study. The study (Clifton & Kreamer-Fults, 2007) found that both the presence of recreation facilities and the presence of driveways are statistically significant. The presence of recreation facilities is positively associated with higher aggregate crash severity for the school zones but the presence of driveways has the opposite effect.

Potentially risky student drop-off behaviours by private vehicle drivers are frequently observed around schools which may contribute to collision risk (Rothman et al., 2017). Based on the study, the most common risky behaviours observed were dropping children at the opposite side of the road from schools (79%) and reversing dangerously (64%). Designated drop-off areas were associated with fewer adults crossing at uncontrolled midblock locations, and fewer adults and children crossing between parked cars. In this study (Rothman et al., 2017), designated drop-offs were found to be protective for several risky driving behaviours and pedestrians crossing at uncontrolled locations mid-block as well as between parked cars.

### Methodology

A total of 30 schools was chosen for this study which is based on school type, area type and road type. These schools were chosen based on high-risk school provided by the Ministry of Education. For this study, the primary data collection is through on-site observation by a trained researcher and research assistant. The data were collected in the afternoon after the school hour was over for the morning session. Due to variation of the actual time the school end, the duration of observation is 30 minutes from the actual time school end to standardized the data collection and ensure the similarity of data. The risk ratio for pedestrian motor-vehicle crashes within 150 m of a school was almost 6 times higher than that for distances >450 m from a school (Rothman et al., 2017), hence the data will be collected within 50 m radius from the school gate or the school entrance. If there is more than one entry of the school, the on-site observation was carried out at all school entrances.

### Finding & Discussion

As mentioned in previous section, there were 30 primary schools selected for this study. Out of these 30 schools only 11 schools with the presence of D&P. The observation on-site also shows that, some schools are using physical separation such as median kerb or fence to separate the D&P area with the main road.

Table 2 shows the school characteristic with the presence of D&P according to city, road type and area type. From the table it can be observed that most school with D&P availability located on primary street road, where there were three (3) school located on federal/state road and only 1 school located on local street.

**Table 2. The school characteristic with presence of D&P**

School Name	City/District	Road Type	Area Type
SK Teluk Gadong	Klang	Primary street	Urban
SK Sungai Udang	Klang	Primary street	Urban
SK Tambak Jawa	Jeram	Federal/State road	Rural
SK Sungai Haji Dorani	Sungai Besar	Primary street	Rural
SK Tanjung Karang	Tanjong	Federal/State road	Rural
SJK© Ying Wah	Kapar	Federal/State road	Rural
SJK© Pandamaran B	Pelabuhan Klang	Primary street	Urban
SK Seksyen 6 Shah Alam	Shah Alam	Primary street	Urban
SK Putra Height 2	Subang Jaya	Local street	Rural
SK Pusat Bandar Puchong 2	Puchong	Primary street	Urban
SK Bukit Rimau	Shah Alam	Primary street	Rural

From the on-site observation, the locations where the parents or guardian pick-up the school children with their vehicle was categorized into three categories. D&P is defined as area beyond the road reserve or within the school boundary that is dedicated for dropping off and picking up school children by private vehicles, vans and school buses. D&P usually located nearest to the school main entrance and parallel to the main road. While nearside is pick-up area not within the

D&P area and farside is pick-up area where opposite the school entrance and school children required to cross the main road.

The school children’s pick-up vehicle location distribution is shown in Table 3. In general, it can be observed the D&P utilization varies at these eleven (11) schools. The highest D&P utilization is observed at SK Tambak Jawa with 86.1% and the lowest is at SK Bukit Rimau with only 19.9% rate of utilization. For the rest of nine (9) schools the utilization rate is between 28.3% to 78.4% and the average utilization rate for these eleven (11) schools is 51.9%. It is also important to highlight that, there are two (2) schools with no vehicle pick-up the school children at the farside.

**Table 3. The school children’s pick-up vehicle distribution**

School Name	D&P	Farside	Nearside	Total	% D&P Utilization
SK Teluk Gadong	53	8	90	151	35.1%
SK Sungai Udang	116	36	29	181	64.1%
SK Tambak Jawa	87	0	14	101	86.1%
SK Sungai Haji Dorani	57	25	9	91	62.6%
SK Tanjung Karang	129	41	54	224	57.6%
SJK© Ying Wah	58	2	14	74	78.4%
SJK© Pandamaran B	54	40	97	191	28.3%
SK Seksyen 6 Shah Alam	60	45	3	108	55.6%
SK Putra Height 2	56	28	75	159	35.2%
SK Pusat Bandar Puchong 2	135	0	38	173	78.0%
SK Bukit Rimau	32	55	74	161	19.9%
Total	837	280	497	1614	51.9%

In contrast with the study at 100 schools in Canada (Rothman L, 2017), over half (58%) of school had designated drop off areas. This show that the availability of D&P in Selangor in this study is less than study conducted in Canada. Although there are guidelines (JKR, 2015; PBIC 2007) recommends the designated car drop-off areas in school zone, however, there has been no work previously done to examine how these areas improve safety (PBIC, 2007; Parisi & Hondorp, 2005).

A study by Rothman L. (2017), managed to found that, designated drop-offs were found to be protective for several risky driving behaviours and pedestrians crossing at uncontrolled locations mid-block as well as between parked cars. The same study also concluded that designated car drop-off areas are a low-cost modification to the built environment that can and should be implemented at every school to be done simultaneously with targeted strategies to ultimately reduce vehicular traffic and increase active school transportation.

Drop-off and pick up location at safe point ensure the safety of school children. Similar to this study, a study in Thailand (Sattanon, & Upala, 2018) shows that parents mostly parked their cars and dropped their children off in front of the school gate (35%). Besides than this 24.3% of parents parked and dropped their children at the sidewalk in front to school which is similar to nearside in this study context. Hence this shows that parents do feel the risk of dropping their

children in front and nearside of school is lesser and safer. However, in contrast to this, the most common risky behaviours observed were dropping children at the opposite side of the road from schools (79%) and walking across at uncontrolled midblock locations (Rothman, 2017).

### **Conclusion & Recommendation**

As a conclusion, the study found D&P are only available at 11 schools that out of 30 selected primary schools. In terms of utilization of D&P at these 11 schools, 52% of the observed school children used this facility. At school with D&P also the remaining school children were picked up by their vehicles outside of the D&P area with 31% at nearside of the school and 17% at the far side of the school. In this study, it shows that the D&P utilization for dropping and picking up school children can be further increase if parents/bus drivers do not wait in D&P. With the high and the effective D&P utilization, it will lower the risk of school children involved in an accident while crossing the road.

International practices could be adopted with providing the school children parents and guardian education and information on the best practice to use the D&P effectively hence directly will increase the D&P utilization. Besides than this, signage could be put up in the D&P zone to give reminder to parents and guardian to only use the zone for only pick-up and drop-off not to use as waiting area with this will opportunity for more school children to utilize the D&P zone.

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