Road Design and Route Options for Cycling Safety

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Abstract. This report will examine two proposes, road design, and infrastructure to reduce the cyclists’ accidents and right route option avoid for safe cycling. Cycling is a good recreational activity. It can improve both our physical body and mental health. Bicycle save more space for parking and reduce traffic jam. As the number of the cyclists increase, cyclists safety will become an important topic. Therefore, the government should apply engineering knowledge to design suitable roads and infrastructure which can protect cyclists from getting injuries. Engineers are also promoted to create more useful apps and help cyclists choose routes. These measures can improve the cycling infrastructure and facilities and reduce the crash, as a result, cycling will become safer.

Introduction

Cycling is becoming a more popular mode of transportation, especially now. Recently, cycling is not only a way of going from an origin to a destination but also an outdoor exercise. Cycling generally can produce less pollution than other transportations. Cycling is really popular among people from all ages (Cycling Plus Magazine, 2016). However, as the number of cyclists increase the number of cyclists crash accident could increase as well. This make cyclists become vulnerable when they go riding (Wegman, Zhang, & Dijkstra, 2012, pp. 19-29). It is important to apply science and engineering knowledge to come out some methods which can reduce the risks of cycling. Scientists conduct experiment and analysis the cycling accidents data from the experiment. They could obtain better road designs or cycling route options. This report will examine two proposes, road design, and infrastructure to reduce the cyclists’ accidents and right route option avoid for safe cycling.

Roads Design and Infrastructure for Safe Cycling

Road design and infrastructure can reduce the collision between bicycles and motor vehicles. Different places have different cycling risks (Wegman et al., 2012, p. 19). Geographical engineering knowledge plays an important role in designing the roads which can reduce the risks of cycling crash accidents. Engineers should also consider the road parameters of cycling. For example, they should consider the clearance between the motor vehicles lane and bike lane. In this section, safe roads design will be introduced using geographical engineering knowledge and road parameters.

Geographical Engineering Information for Cycling Roads and Facilities Designs

Well-designed cycling roads and facilities can reduce the risks for cyclists. Roads have two general categories: flat roads and sloping roads. Cycling risks in these two roads are different because the roads parameters are not the same. For example, the two roads width is not consistency and the speed of cyclists on the two categories roads have different requirement. The roads width is not consistency and usually the speed on the sloping road is lower than that on the flat road (Velominati, 2016). Besides the roads design, cycle facilities are also able to reduce the cycling risks. For example, the location of reflector is critical. The places to put reflector are calculated by using the number of
turnings and the roads slope (Date & Sundaraman, 2012). The facilities are requested for cyclists to wear can protect them from getting serious injuries. Helmets protect cyclists from getting serious head crashes, thus, cyclists are asked to wear helmets in many countries (Puncher & Buehler, 2012). These designs and rules are helpful for reducing the risks of cycling.

Roads Infrastructure for Safe Cycling

High-quality infrastructure is needed to protect cyclists. Scientists examine from three parts the infrastructure, the cyclists and the bicycle. A conceptual framework for cycling safety were created by scientists. This provides information for policy makers to make policies which protect cyclists (Schepers, Hagenzieker, Methorst, Wee, & Wegman, 2014, pp. 331-340). Infrastructure has greatly affected the bicycle commuting (Krizek, Barnes, & Thompson, 2009, pp.66-73). Thus, infrastructure can have an impact on cyclists’ safety. The roads which contain both motor vehicle lane and cycling lane need proper clearance to reduce the crashes between bikes and cars. When motorists speed is at 20 mph, the clearance should be 0.85 meters. If the speed becomes 30 mph, the clearance will be 1.05 meters (Department for Transport, 2008). The dimensions of cycles are also important since it affects the cyclists’ control of their bikes (Hadland & Lessing, 2014). The above information is used to improve the infrastructure. As a result, it reduces cyclists’ risks.

Route Options to Reduce the Incidence of Cycling Accidents

Cyclists can be protected by choosing a safe cycling route. Route options are critical in reducing the cycling accidents. It is important to know the risks on each road. Thus, engineers map the risk of collision between motor vehicles and cyclists to obtain safer cycling routes (Yiannakoulias, Bennet, & Scott, 2012, pp.164-172). Figure 1 shows the perceived risks in different routes in Galway and the perceived risks increase as the score of roads increase. It also shows the location of cyclists’ collision.

![Figure 1. Galway City road network](image)

Figure 1. Galway City road network, indicative perceived safety ratings and location of cycling collision. From “Using mental mapping to unpack perceived cycling risk,” by R. Manton, H. Rau, F. Fahy, J. Sheahan and E Clifford, 2016, Accident Analysis and Prevention 88, p.144. Elsevier. Adapted with permission.

These data can be used to generate the safety route options for cyclists. MapMyRide is a mobile application which provides popular routes for cyclists. It tracks your route and tell you where you need to go (2016). Cyclists go cycling on a safer route help them concentrate on cycling and reduce the collision with cars, at the same time.
Conclusion

Cycling is a good recreational activity. It can improve both our physical body and mental health (Oja et al., 1998). Bicycle save more space for parking and reduce traffic jam. Policy makers recognized the benefits of cycling, so they encourage more citizen to cycle (Bergstrom & Magnusson, 2003). As the number of the cyclists increase, cyclists safety will become an important topic. Therefore, the government should apply engineering knowledge to design suitable roads and infrastructure which can protect cyclists from getting injuries. Engineers are also promoted to create more useful apps and help cyclists choose routes. These measures can improve the cycling infrastructure and facilities and reduce the crash, as a result, cycling will become safer.

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