Standards for Bikeway Design and Construction in Thailand

On 19th January 2016, the government cabinet passed a resolution agreeing to proposals made by the Ministry of Transport (MoT) as follows:

1. Agreed that standards should be set up for bikeway design and construction in Thailand that all government agencies would be referring to in the construction of bikeways, so that they would have the same forms and standards all over the country.

2. Agreed that MoT, Ministry of Interior (MoI), Ministry of Tourism and Sports (MoTS), Prime Minister Office (PMO), Ministry of Education (MoE), Royal Thai Police (RTP) and Thai Health Promotion Foundation gve cooperation and supports to develop and promote transportation of the people with bicycle a to their mandates, duties and responsibilities by using a Manual of Standards for Bikeway Design and Construction in Thailand for reference, so that bikeways would be constructed in the same forms and standards all over the country.

3. Agreed that responsible agencies were to make an agreement in details with Bureau of the Budget to allocate budget for annual expenditure to implement measures to promote and support transportation of the people by bicycle according to related legal procedure and regulations.

Manual of Standards for Bikeway Design and Construction in Thailand has key contents consisting of Bikeway Classification, Geometric Design of Bikeway, Pavement Design, Traffic Signs Design, Bikeway's Pavement Markings and Safety Facilities, Traffic Safety System, and Guidelines for Bicycle Parking Facilities, which developed from bikeway standards of the **American Association of State Highway and Transportation Officials (AASHTO)** which are recognized worldwide and the **Manual on Uniform Traffic Control Devices (MUTCD)** with details as follows:

1. **Bikeway Classification** uses speed and volume of motorized vehicular traffic as the control factor for classification of bikeways (adapted to make it appropriate for Thailand) as follows:
    1) For roadways where an average speed of motorized vehicles is lower than 30 kilometre per hour (km/h) and a yearly average volume of motorized vehicular traffic is less than 3,000 vehicles per day, bicycles can use traffic lanes together with other vehicles in ordinary traffic lanes. If volume of motorized vehicular traffic is more than 3,000 but no more than 5,000 vehicles per day, bicycles can use traffic lanes together with other vehicles, such as the traffic lane next to roadway curb or roadside car parking spaces. In case that volume of motorized vehicular traffic is more than 5,000 vehicles per day, bike lanes cannot be implemented.
    2) For roadways where an average speed of motorized vehicles is between 30 to 50 kilometre per hour (km/h) and a yearly average traffic volume is less than 3,000 vehicles per day, bicycles can use traffic lanes together with other vehicles, such as the traffic lane next to roadway curb or roadside car parking spaces. If traffic volume is more than 3,000 but no more than 5,000 vehicles per day, bike lane is to be specifically designated with markings on pavement clearly separating bike lane from other traffic lanes and safety facilities on road shoulder and main lanes. In case that volume of motorized vehicular traffic is more than 5,000 vehicles per day, specifically designated bikeway is to be provided with markings on pavement clearly separating bikeway from traffic lanes.

3) For roadways where an average speed of motorized vehicles is between 50 to 70 kilometre per hour (km/h), specifically designated bikeway is to be provided with markings on pavement clearly separating bikeway from traffic lanes and safety facilities on road shoulder and main lanes, or a bikeway is to be provided separated from general traffic lanes, such as bikeway newly constructed with concrete barrier to separate main traffic lanes from footpaths and bikeway.
4) For roadways where an average speed of motorized vehicles is higher than 70 kilometre per hour (km/h), specifically designated bikeway, such as on road shoulder with divider or barrier to separate it from motorized vehicular traffic, is to be provided.
5) In case that the volume of motorized vehicular traffic is 10,000 vehicles per day or more, and an average speed of motorized vehicles is 80 kilometre per hour (km/h) or more, bike way must be constructed outside clear zone of roadway.
6) In case that the volume of large motorized vehicles is more than 30 vehicles per hour in the outermost lane, use of roadway embankment as bikeway should be considered. Or if another type of bikeway is used and an average speed of motorized vehicular traffic is high (80 km/h or more), an open space should be used to buffer between bicycles and motorized vehicles.
7) In areas where bicycle users are expected to be children or those who have little experience riding bicycle, such as areas near school, in community or public park, for example, specific areas must be provided for bicycles to separate bike way from roadway.

2. **Geometric design of bikeway** has design standards as follows:
   1) Speed and Safety Stop Distance
   2) Traffic Sign System
   3) Horizontal Curve Design
   4) Vertical Curve Design
   5) Lateral Clearance Design under Safe Bicycle Stop Distance
   6) Crossroad Design

3. Pavement design of bikeway

Bikeway infrastructure Design according to AASHTO standards is as follows:

1) Where road shoulder is used as bike lane, existing pavement of the route is adopted.
2) Design for Multi Use Path-type of traffic lanes or where bike way is separated from general traffic lanes, such as when a new bike way is constructed with concrete ridge or road island dividing traffic lanes. Structure of pavement is required to be as follows:
   2.1) 5 cm. asphalt pavement, 15 cm. ground, 15-30 cm. foundation
   2.2) Double Surface Treatment pavement, 15 cm. ground, 15-30 cm. foundation
   2.3) 10 cm. concrete pavement, 5 cm. sandy ground, 10 cm. foundation

4. **Design of Traffic Signs, pavement markings, and safety system for bikeways** consist of design of legends on traffic signs and installing locations, and design of markings on pavement.

5. **Traffic Safety System** consists of blinking light system on signs placed at bikeways and lighting system.

6. Guidelines for Bicycle Parking Facilities

Specification for Bicycle Parking Facilities by the U.S. Department of Transportation, Federal Highway Administration (2006), provides recommendations that to specify standards for bicycle parking facilities, details must be taken into consideration.

Areas that bicycle parking facilities need to be considered	**Standards for bicycle parking facilities**
1. Residential buildings	(1) 1 bicycle per 3 residential units
2. Club houses (that are used for doing activities) or sport clubs	(2) 1 bicycle per activity room (plus 3 per cent of maximum capacity)
3. Society buildings or places used for social gatherings of various faculties	(3) 1 bicycle per social function room
4. Hotels or apartments	(4) 1 bicycle per 20 staff
5. Libraries, museum, exhibition halls and galleries	(5) 1 bicycle per 10 parking lots for motorised vehicles
6. Schools, colleges and universities	(6) 1 bicycle for 4 staff
7. Kindergartens and primary schools	(7) 1 bicycle for 4 students
8. Rehabilitation facilities, clinics and institutions	(8) 1 bicycle for 10 staff
9. Hospitals	(9) 1 bicycle for 20 staff
10. Shopping malls, cinema theaters – complexes and avenue	(10) 1 bicycle for 20 staff
11. Business districts and industrial estates	(11) 1 bicycle per 10 parking lots for motorised vehicles
12. Other areas	(12) 1 bicycle per 10 parking lots for motorised vehicles
	Designers and users must use their discretion to determine what point of these guidelines would be used for a concerned area.

Meeting of the Government Cabinet headed by Prime Minister General Prayuth Chan-ocha

19th January 2016