

**MINISTRY OF TRANSPORT, VIETNAM**

**SPECIAL ASSISTANCE FOR  
PROJECT IMPLEMENTATION (SAPI)  
FOR ITS INTEGRATION PROJECT  
ON NEW NATIONAL HIGHWAY NO.3  
& NORTHERN AREA OF VIETNAM**

**APPENDIX 1**

**REVIEW OF CURRENT CONDITIONS & LEGAL AFFAIRS**

**AUGUST 2012**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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**ORIENTAL CONSULTANTS CO., LTD.  
NEXCO EAST ENGINEERING CO., LTD.  
NIPPON KOEI CO., LTD  
TRANSPORTATION RESEARCH INSTITUTE CO., LTD  
LANDTEC JAPAN INC.**

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**FINAL REPORT IN AUGUST 2012**

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## **1. Introduction**

The existing conditions of expressway in Vietnam has been comprehended particularly for the site conditions of the target expressway sections of the ITS Integration Project in Hanoi metropolitan area taking ITS related equipment components installation into consideration. On the other hand, the laws and regulations related to the ITS is also comprehended and updated from the study result of ITS Master Plan under the study of VITRANSS2, and Draft ITS Standards Study.

The major survey items for the target expressway sections are comprehension of existing conditions of expressway construction, comprehension of traffic conditions of existing road network through probe vehicle survey, comprehension of existing conditions of collection and dissemination of road traffic conditions, comprehension of ITS related equipment components installation conditions, comprehension of ETC introduction condition, comprehension of existing conditions of site where the roadside equipment components will be installed, comprehension of electric power supply condition, and comprehension of telecommunication service.

As for the laws and regulations, it has been confirmed existing conditions for the Law on Road Traffic, Degree on the Vietnam Expressway Network Development Master Plan toward 2020 and vision beyond 2020, circular on Providing for Road Administration and Maintenance, circular on Regulations on the Loading Capacity, Limit of Roads, circular on Stipulating specifications and exploiting conditions of short range radio frequency devices of conditional use, and so on.

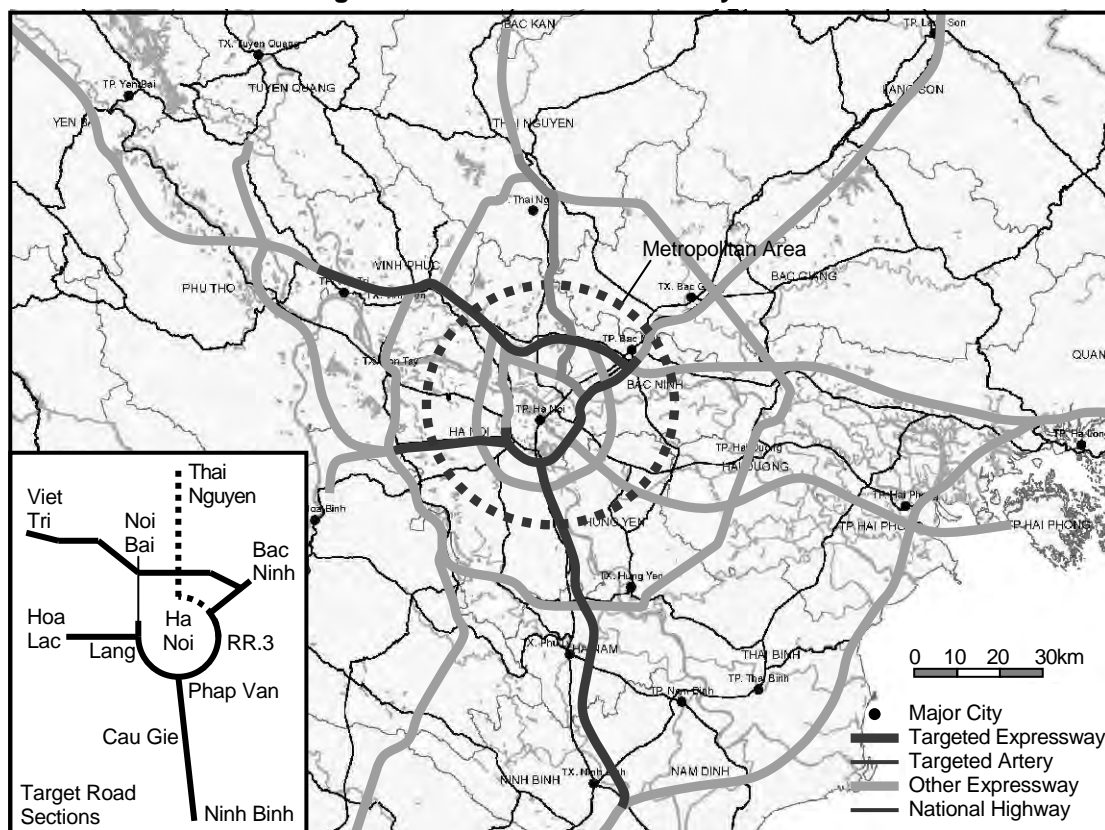
The frameworks related to the operation using ITS are proposed and discussed with related parties of Vietnam on the basis of the result of comprehension of existing conditions.

## 2. Existing Conditions

### 2.1 Road Network

Ha Noi Metropolitan Area is to be defined as the study area. The targeted expressway are indicated “Red Lines”, follows figure 6.1. The targeted expressway include Mai Dich-Thanh Tri (Ring Road 3), Noi Bai-Bac Ninh (NH18), Ha Noi-Bac Ninh (NH1) and Lang-Hoa Lac

**Figure 2.1 Road Network in Study Area**



Target Road Sections for New Discussion	Length	Target Road Sections for Revising Discussion	Length
Mai Dich–Thanh Tri (Ring Road 3)	27 km	Ha Noi–Thai Nguyen (National Highway 3)	60 km
Lang–Hoa Lac	28 km	Road Sections to be Conformed	
Phap Van–Cau Gie	30 km	Ha Noi–Hai Phong	105 km
Cau Gie–Ninh Binh	50 km	Viet Tri–Lao Cai	185 km
Ha Noi–Bac Ninh (National Highway 1)	22 km		
Noi Bai–Bac Ninh (National Highway 18)	33 km		
Noi Bai–Viet Tri	80 km	Total	618 km

The targeted expressway is almost constructed (or under construction) exclude the section which is from Noi Bai to Mai Dich section. The section has extreme difficulty imagining when to be constructed.

Station number is configured on the targeted expressway for reasons of expediency, the starting point (STA0+000) is configured at cross section between NH18 and Ring Road 3 in Noi Bai, the end point (STA63+300) is configured at cross section between NH18 and NH1 in Bac Ninh.

In the Ring Road 3, from STA0 +000 of (Noi Bai) to STA19 +300 (Mai Dich), it is not able to estimate that when the construction of expressway is completed on this section. Such the section is access route from the Noi Bai airport to downtown of Ha Noi. Therefore, the traffic volume is so high.

In addition, the section is constructed by the Build-Operate-Transfer (BOT) therefore, tollgate is installed at STA0 +400 operated by a company called VITRACIMEX8.

**Figure 2.2 STA0+000 and STA 0+400 on RingRoad 3**



**STA0+000 Starting Point**



**STA 0+400 Noi Bai Tollgate**

Ring Road 3 is previously developed from the vicinity of DaiKim to ThanhTri Bridge, from BacNinh to ThanhTri Bridge in National Highway-1 and from NoiBai to BacNinh in National Highway-18, these expressway has four lanes already.

In such road section, there are two tollgate at NoiBai (STA0 +400) and ThonVang (STA43 +950). Also, there is plan to build a new tollgate near the ThanhTri Bridge at STA36 +700.

Pavement at short of the tollgate, there are distinguished rutting due to stopped by heavy weight vehicle, such as large trucks. Necessary to consider when the Vehicle Detection is implemented by using Loop-coil type.

**Figure 2.3 STA43+950 and STA 31+100 on RingRoad 3**



**STA43-950 ThonVang Tollgate**



**STA31+100 PhapVan Junction**

To assumed to use a light pole for mounting CCTV Camera. In case of there is a median, light pole are located in the median. However, in case of separation section, light pole are located on both shoulder sides. Therefore, should be considered when installing a CCTV Camera using light pole carefully.

**Figure 2.4 STA33+300 and STA 31+100 on Ring Road 3**



**STA33+300 Ng Tam Trinh Interchange**



**STA31+100 PhapVan Junction**

In case of construct a communication conduit, bury in the median strip and bury both in shoulder sides are considered. However, in the fill section, the water treatment is not constructed at the road shoulder. The road surface drainage flows to the embankment directly, which is cause of damage to the road shoulder.

Therefore, there is the agenda when construct a communication conduit at the embankment of both sides. Also, in case of construct a communication conduit at median, there is the foundation of light pole at median therefore, it is the agenda when conduit is buried.

**Figure 2.5 STA33+300 on Ring Road 3**



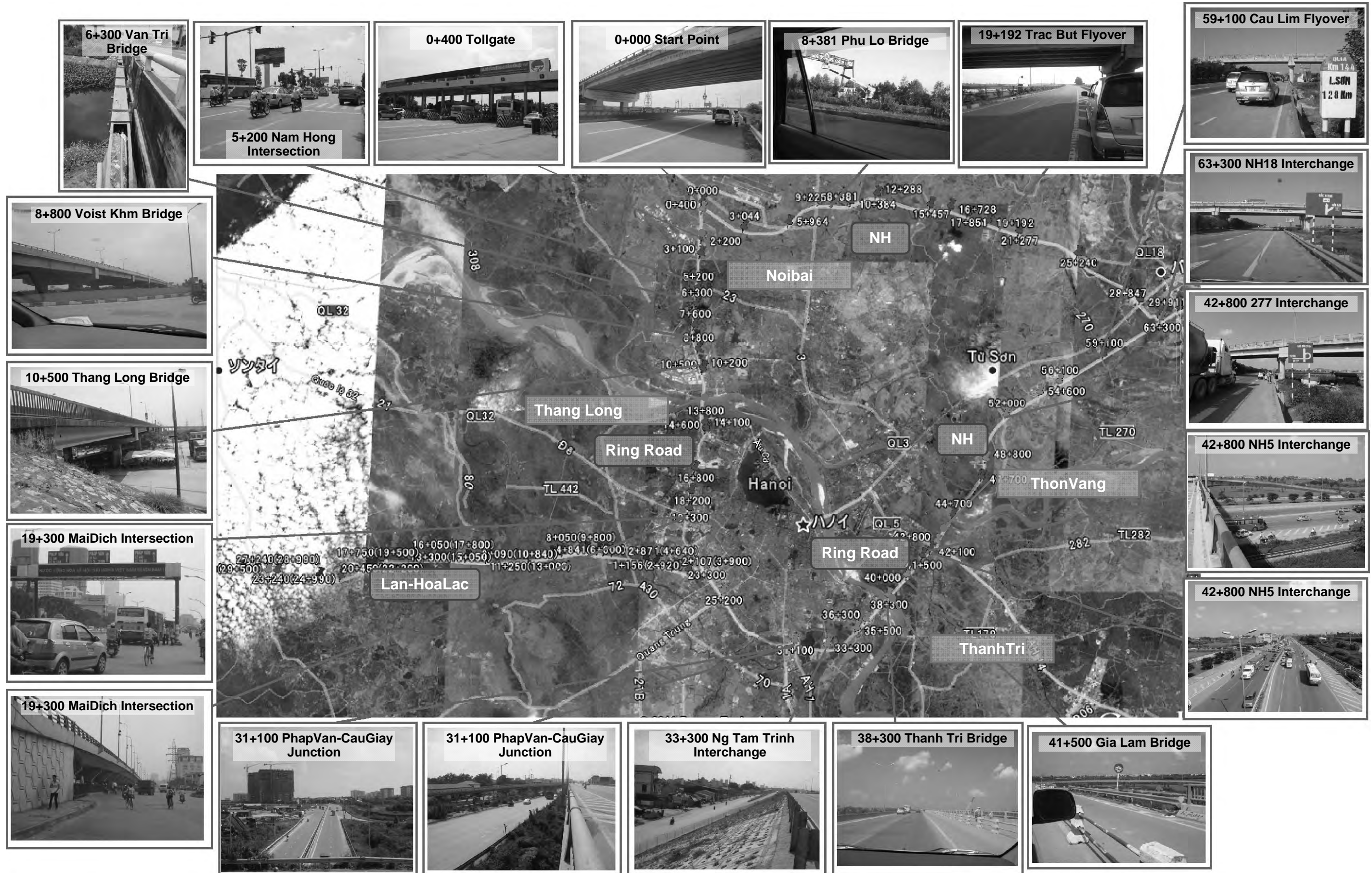
**STA33+300 Ng Tam Trinh Interchange**



**STA33+300 Ng Tam Trinh Interchange**



Figure 2.6 Survey of Existing Conditions of Road





**Table 2.1 STA No. and Description on Ring Road 3**

STA	Description	Latitude	Longitude
0 + 000	Origination	21°12'26.78"N	105°46'45.88"E
0 + 400	Toll Gate	21°12'11.97"N	105°46'47.50"E
2 + 200	Factory Complex	21°11'13.52"N	105°46'49.66"E
3 + 100	Quang Minh Bridge (for Railway)	21°10'43.07"N	105°46'48.54"E
5 + 200	Nam Hong Intersection	21° 9'34.17"N	105°46'45.69"E
6 + 300	Van Tri Bridge	21° 9'1.36"N	105°46'44.22"E
7 + 600	Kenh Giua Bridge	21° 8'18.98"N	105°46'42.35"E
8 + 400	Bridge(no name)	21° 7'54.59"N	105°46'44.86"E
8 + 800	Flyover Bridge for Factory Complex	21° 7'47.32"N	105°46'47.32"E
10 + 200	Viet Thang Bridge	21° 7'31.64"N	105°46'52.48"E
10 + 500	Thang Long Bridge (1)	21° 6'51.84"N	105°47'5.91"E
13 + 800	Thang Long Bridge (2)	21° 4'59.12"N	105°47'16.91"E
14 + 100	Diversing/Merging Point	21° 4'56.46"N	105°47'17.76"E
14 + 600	Pham Van Dong + Tan Xuan Intersection	21° 4'51.50"N	105°47'18.29"E
16 + 800	Pham Van Dong + Co Nhue Intersection	21° 3'31.97"N	105°46'58.95"E
18 + 200	Pham Van Dong + Hoang Quoc Viet Intersection	21° 2'46.13"N	105°46'52.70"E
19 + 300	Mai Dich Intersection	21° 2'11.77"N	105°46'50.37"E
23 + 300	Trung Hoa Interchange	21° 0'18.53"N	105°47'32.25"E
25 + 200	Thanh Xuan Interchange	20°59'29.40"N	105°48'11.53"E
31 + 100	Phap Van Interchange	20°57'56.54"N	105°50'49.98"E
33 + 300	Nguyen Tam Trinh Interchange	20°57'50.59"N	105°52'0.04"E
35 + 500	Linh Nam Bridge	20°58'28.05"N	105°53'1.21"E
36 + 300	Linh Nam Interchange	20°58'46.41"N	105°53'21.16"E
38 + 300	Thanh Tri Main Bridge	20°59'36.91"N	105°54'6.27"E
40 + 000	turn to Gia Lam Dike	21° 0'19.34"N	105°54'44.22"E
41 + 500	Gia Lam Bridge	21° 0'59.49"N	105°55'16.19"E
42 + 200	Bay Bridge	21° 1'13.05"N	105°55'32.51"E
42 + 800	NH5 Interchange	21° 1'29.36"N	105°55'44.96"E
43 + 950	NH1 Tollgate	21° 2'2.85"N	105°56'1.57"E
44 + 700	Phu Dong Bridge	21° 2'23.84"N	105°56'16.27"E
47 + 700	Enlarge Shoulder	21° 3'43.03"N	105°57'14.12"E

**Table 2.2 STA No. and Description on National Highway 1**

STA	Description	Latitude	Longitude
47 + 700	Enlarge Shoulder	21° 3'43.03"N	105°57'14.12"E
48 + 800	Half Interchange	21° 4'19.72"N	105°57'21.72"E
52 + 000	277 Interchange	21° 5'50.38"N	105°58'0.22"E
54 + 600	295 Interchange	21° 6'37.98"N	105°59'10.55"E
56 + 100	Tien Son Factory Complex	21° 7'1.81"N	105°59'50.78"E
59 + 100	Cau Lim Over Bridge	21° 8'0.56"N	106° 1'23.26"E
63 + 300	NH18 Interchange	21° 9'18.63"N	106° 3'24.15"E
64 + 600	38 Interchange	21° 9'41.81"N	106° 4'0.33"E
67 + 200	NH18 Intersection	21°10'21.23"N	106° 5'22.02"E

**Table 2.3 STA No. and Description on National Highway 18**

STA	Description	Latitude	Longitude
0 + 000	Origination	21°12'26.78"N	105°46'45.88"E
3 + 044	Doai Bridge	21°11'39.80"N	105°48'17.76"E
5 + 964	Phu Minh Bridge	21°11'53.60"N	105°49'54.06"E
8 + 381	Phu Lo Bridge	21°12'39.94"N	105°50'56.13"E
9 + 225	Dong Danh Bridge	21°12'39.51"N	105°51'27.04"E
10 + 384	Dong Xuan Bridge	21°12'41.81"N	105°52'5.25"E
12 + 288	Bridge 1-6	21°13'0.24"N	105°53'0.12"E
15 + 457	Ca Lo Bridge	21°12'43.52"N	105°54'56.58"E
16 + 728	Yen Vi Bridge	21°12'41.61"N	105°55'39.65"E
17 + 851	Hoa Tien Bridge	21°12'30.20"N	105°56'17.67"E
19 + 192	Trac But Bridge	21°12'17.79"N	105°57'2.03"E
20 + 000	295 interchange	21°12'10.09"N	105°57'29.57"E
21 + 277	Trung Nghia Bridge	21°11'59.42"N	105°58'9.78"E
25 + 240	Dong Yen Bridge	21°11'20.33"N	106° 0'17.76"E
28 + 847	Dao Xa Bridge	21°10'24.13"N	106° 2'7.16"E
29 + 911	Xuan O Bridge	21° 9'53.75"N	106° 2'37.18"E
31 + 801	NH1 Interchange	21° 9'18.63"N	106° 3'24.15"E

**Table 2.4 Detailed Conditions of Road Sections (1)**

Section	Station	Type	Ave. span length (m)	Type of bridge	Type of pier
<b>Ringroad No.3</b>	Km 19+210.000 - Km 19+430.000	Mai Dich IC		PC - Slab	RC Single
	Km 19+430.000 - Km 19+860.000	Earthwork			
	Km 19+860.000 - Km 22+620.000	Bridge	40	Super tee	PC - Single
	Km 22+620.000 - Km 22+700.000	Bridge	40	Super tee	RC - Bent
	Km 22+700.000 - Km 23+840.000	Bridge	40	Super tee	PC - Single
	Km 23+840.000 - Km 24+100.000	Bridge	40	Super tee	PC - Bent
	Km 24+100.000 - Km 24+500.000	Bridge	40	Super tee	PC - Single
	Km 24+500.000 - Km 24+660.000	Bridge	40	Super tee	PC - Bent
	Km 24+660.000 - Km 25+700.000	Bridge	40	Super tee	PC - Single
	Km 25+700.000 - Km 25+860.000	Bridge	40	Super tee	PC - Bent
	Km 25+860.000 - Km 28+531.000	Bridge	40	Super tee	PC - Single
	Km -1-850.000 - Km 0+000.000	Bridge	33	PCI	RC - Double
	Km 0+000.000 - Km 0+050.000	Bridge	50	PC-Box	RC -
	Km 0+050.000 - Km 1+120.000	Bridge	33	PCI	RC - Double
	Km 1+120.000 - Km 1+640.000	Earthwork			
	Km 1+640.000 - Km 1+760.000	Kim Nguu Bridge	33	PCI	RC - Double
	Km 1+760.000 - Km 2+770.000	Earthwork			
	Km 2+770.000 - Km 2+820.000	Nguyen Tam Trinh bridge	50	PC-Box	RC -
	Km 2+820.000 - Km 5+600.000	Earthwork			
	Km 5+600.000 - Km 5+660.000	Linh Nam bridge	60	PC-Box	RC -
	Km 5+660.000 - Km 6+220.000	Earthwork			
	Km 6+220.000 - Km 6+460.000	Thanh Tri bridge	33	PCI	RC - Double
	Km 6+460.000 - Km 6+800.000	Thanh Tri bridge	130	PC-Box	RC - Double
	Km 6+800.000 - Km 7+280.000	Thanh Tri bridge	50	PC-Box	RC - Double
	Km 7+280.000 - Km 7+980.000	Thanh Tri bridge	130	PC-Box	RC - Double
	Km 7+980.000 - Km 8+920.000	Thanh Tri bridge	50	PC-Box	RC - Double
	Km 8+920.000 - Km 9+100.000	Thanh Tri bridge	130	PC-Box	RC - Double
	Km 9+100.000 - Km 9+300.000	Thanh Tri bridge	33	PCI	RC - Double
	Km 9+300.000 - Km 9+420.000	Retaining wall			
	Km 9+420.000 - Km 10+900.000	Earthwork			
	Km 10+900.000 - Km 10+940.000	Bridge	33	PCI	RC -
	Km 10+940.000 - Km 11+380.000	Earthwork			
	Km 11+380.000 - Km 11+640.000	Bridge	33	PCI	RC -
	Km 11+640.000 - Km 11+760.000	Earthwork			
	Km 11+760.000 - Km 12+460.000	Bridge	33	PCI	RC - Double
	Km 12+460.000 - Km 12+830.000	Earthwork			
	Km 0+0.000 -	Tunnel	300		
	Km 3+800.000 - Km 4+000.000	Seagames interchange	20	Slab	RC - Single
	Km 4+000.000 - Km 5+0.000	Earthwork			
	Km 5+0.000 - Km 5+40.000	Sông Nhuệ bridge	33	PCI	RC - Double
Km 5+40.000 - Km 5+80.000	Earthwork				
Km 5+80.000 - Km 5+100.000	Bridge	33	PCI	RC -	
Km 5+100.000 - Km 5+640.000	Earthwork				
Km 5+640.000 - Km 5+660.000	Bridge	20	Slab	RC -	
Km 5+660.000 - Km 7+200.000	Earthwork				
Km 7+200.000 - Km 7+400.000	Tunnel	200			
Km 7+760.000 - Km 7+800.000	Bridge	20	Slab	RC - Single	
Km 7+800.000 - Km 8+460.000	Earthwork				
Km 8+460.000 - Km 8+480.000	Bridge	20	Slab	RC -	
Km 8+480.000 - Km 8+860.000	Earthwork				
Km 8+860.000 - Km 8+880.000	Bridge	20	Slab	RC -	
Km 8+880.000 - Km 9+650.000	Earthwork				
Km 9+650.000 - Km 9+670.000	Bridge	20	Slab	RC -	
Km 9+670.000 - Km 9+790.000	Earthwork				
Km 9+790.000 - Km 9+810.000	Bridge	20	Slab	RC -	

Source: ITS Integration Project (SAPI) Study Team

**Table 2.5 Detailed Conditions of Road Sections (2)**

<b>Lãng - Hòa Lạc expressway</b>	Km 9+810.000 - Km 10+20.000	Earthwork			
	Km 10+20.000 - Km 10+40.000	Bridge	20	Slab	RC -
	Km 10+40.000 - Km 10+340.000	Earthwork			
	Km 10+340.000 - Km 10+360.000	Bridge	20	Slab	RC -
	Km 10+360.000 - Km 10+830.000	Earthwork			
	Km 10+830.000 - Km 10+850.000	Bridge	33	PCI	RC -
	Km 10+850.000 - Km 11+180.000	Earthwork			
	Km 11+180.000 - Km 11+220.000	Bridge	33	PCI	RC - Double
	Km 11+220.000 - Km 11+580.000	Earthwork			
	Km 11+580.000 - Km 11+600.000	Bridge	20	Slab	RC -
	Km 11+600.000 - Km 11+660.000	Earthwork			
	Km 11+660.000 - Km 11+690.000	Bridge	20	Slab	RC -
	Km 11+690.000 - Km 11+770.000	Earthwork			
	Km 11+770.000 - Km 11+790.000	Bridge	20	Slab	RC -
	Km 11+790.000 - Km 12+380.000	Earthwork			
	Km 12+380.000 - Km 12+400.000	Bridge	20	Slab	RC -
	Km 12+400.000 - Km 12+960.000	Earthwork			
	Km 12+960.000 - Km 12+980.000	Bridge	20	Slab	RC -
	Km 12+980.000 - Km 15+60.000	Earthwork			
	Km 15+60.000 - Km 15+80.000	Bridge	20	Slab	RC -
	Km 15+80.000 - Km 15+250.000	Earthwork			
	Km 15+250.000 - Km 15+500.000	Sông Đáy Bridge	33	PCI	RC - Double
	Km 15+500.000 - Km 15+610.000	Earthwork			
	Km 15+610.000 - Km 15+630.000	Bridge	20	Slab	RC -
	Km 15+630.000 - Km 15+990.000	Earthwork			
	Km 15+990.000 - Km 16+10.000	Bridge	20	Slab	RC -
	Km 16+10.000 - Km 18+345.000	Earthwork			
	Km 18+345.000 - Km 18+365.000	Bridge	20	Slab	RC -
	Km 18+365.000 - Km 19+120.000	Earthwork			
	Km 19+120.000 - Km 19+140.000	Đồng Mô Bridge	20	Slab	RC -
	Km 19+140.000 - Km 19+900.000	Earthwork			
	Km 19+900.000 - Km 19+920.000	Bridge	20	Slab	RC -
	Km 19+920.000 - Km 20+360.000	Earthwork			
	Km 20+360.000 - Km 20+380.000	Bridge	20	Slab	RC -
	Km 20+380.000 - Km 20+780.000	Earthwork			
	Km 20+780.000 - Km 20+800.000	Bridge	20	Slab	RC -
	Km 20+800.000 - Km 21+350.000	Earthwork			
	Km 21+350.000 - Km 21+370.000	Bridge	20	Slab	RC -
	Km 21+370.000 - Km 22+180.000	Earthwork			
	Km 22+180.000 - Km 22+200.000	Bridge	20	Slab	RC -
Km 22+200.000 - Km 22+710.000	Earthwork				
Km 22+710.000 - Km 22+730.000	Bridge	20	Slab	RC -	
Km 22+730.000 - Km 23+140.000	Earthwork				
Km 23+140.000 - Km 23+210.000	Sông Tích Bridge	33	PCI	RC - Double	
Km 23+210.000 - Km 23+650.000	Earthwork				
Km 23+650.000 - Km 23+670.000	Bridge	20	Slab	RC -	
Km 23+670.000 - Km 24+150.000	Earthwork				
Km 24+150.000 - Km 24+170.000	Bridge	20	Slab	RC -	
Km 24+170.000 - Km 25+250.000	Earthwork				
Km 25+250.000 - Km 25+270.000	Bridge	20	Slab	RC -	
Km 25+270.000 - Km 25+850.000	Earthwork				
Km 25+850.000 - Km 25+870.000	Bridge	20	Slab	RC -	
Km 25+870.000 - Km 26+310.000	Earthwork				
Km 26+310.000 - Km 26+360.000	Bridge	33	PCI	RC - Double	
Km 26+360.000 - Km 26+580.000	Earthwork				
Km 26+580.000 - Km 26+600.000	Bridge	20	Slab	RC -	
Km 26+600.000 - Km 27+60.000	Earthwork				
Km 27+60.000 - Km 27+80.000	Bridge	20	Slab	RC -	
Km 27+80.000 - Km 27+250.000	Earthwork				
Km 27+250.000 - Km 27+270.000	Bridge	33	PCI	RC -	
Km 27+270.000 - Km 27+980.000	Earthwork				
Km 27+960.000 - Km 27+980.000	Bridge	20	Slab	RC -	

Source: ITS Integration Project (SAPI) Study Team

**Table 2.6 Detailed Conditions of Road Sections (3)**

	Km 27+980.000 - Km 29+000.000	Earthwork			
<b>Pháp Vân - Cầu Giẽ expressway</b>	Km 181+570.776 - Km 182+900	Earthwork			
	Km 182+900 - Km 182+940	Van Dien Bridge	33	PCI	RC - Double
	Km 182+940 - Km 204+191	Earthwork			
	Km 204+191 - Km 204+191	Van Diem Bridge	33	PCI	RC - Double
	Km 204+191 - Km 211+082.962	Earthwork			
<b>Cầu Giẽ - Ninh Bình expressway</b>	Km 211+000 - Km 214+840	Earthwork			
	Km 214+720 - Km 215+340	Gie Bridge	42	PCI	Double
	Km 215+080 - Km 218+600	Earthwork			
	Km 218+612.675 - Km 218+880.225	Vuc Vong Bridge	33	PCI	Double
	Km 218+900 - Km 229+694.335	Earthwork			
	Km 229+694.335 - Km 229+694.335	Phu Thu Bridge	N		
	Km 229+694.335 - Km 229+850	Earthwork			
	Km 229+850 - Km 230+550	Bridge	N		
	Km 230+550 - Km 230+700	Earthwork			
	Km 230+700 - Km 230+700	Bridge	N		
	Km 230+700 - Km 231+460.00	Earthwork			
	Km 231+460.00 - Km 231+460.00	Bridge	N		
	Km 231+460.00 - Km 233+100	Earthwork			
	Km 233+100 - Km 233+420	Van Lam Bridge	N		
	Km 233+420 - Km 237+864	Earthwork			
	Km 237+864 - Km 237+864	Cham Thi bridge	N		
	Km 237+864 - Km 242+273.26	Earthwork			
	Km 242+273.26 - Km 243+327.36	Bridge	N		
Km 243+327.36 - Km 248+843	Earthwork				
Km 248+843 - Km 248+843	Bridge	N			
Km 248+843 - Km 259+000	Earthwork				
<b>Hà Nội - Bắc Ninh expressway</b>	Km 143+000.000 - Km 145+100.000	Earthwork			
	Km 145+100.000 - Km 145+180.000	Nội Duệ bridge	33	PCI	RC - Double
	Km 145+180.000 - Km 158+000.000	Earthwork			
	Km 158+000.000 - Km 158+800.000	Phù Đồng bridge	100	PC-Box	RC - Double
	Km 158+800.000 - Km 158+900.000	Phù Đồng bridge	33	PCI	RC - Double
	Km 158+900.000 - Km 160+586.639	Earthwork			
<b>Nội Bài - Bắc Ninh expressway</b>	Km 0+0.000 - Km 0+126.229	Earthwork			
	Km 0+120.000 - Km 0+120.000	Flyover Noi Bai airport	33	PCI	RC - Single
	Km 0+120.000 - Km 3+030.000	Earthwork			
	Km 3+030.000 - Km 3+060.000	Đoài bridge	33	PCI	RC -
	Km 3+060.000 - Km 5+910.000	Earthwork			
	Km 5+910.000 - Km 6+020.000	Phú Minh bridge	33	PCI	RC - Double
	Km 6+020.000 - Km 8+260.000	Earthwork			
	Km 8+260.000 - Km 8+500.000	Phù Lỗ bridge	33	PCI	RC - Double
	Km 8+500.000 - Km 9+080.000	Earthwork			
	Km 9+080.000 - Km 9+380.000	Đồng Dành bridge	33	PCI	RC - Double
	Km 9+380.000 - Km 12+280.000	Earthwork			
	Km 10+400.000 - Km 10+600.000	Đồng Xuân bridge	33	PCI	RC - Double
	Km 10+600.000 - Km 12+280.000	Earthwork			
	Km 12+280.000 - Km 12+300.000	Xuân Dương bridge	33	PCI	RC -
	Km 12+300.000 - Km 15+320.000	Earthwork			
	Km 15+320.000 - Km 15+590.000	Cà Lỗ bridge	33	PCI	RC - Double
	Km 15+590.000 - Km 16+710.000	Earthwork			
	Km 16+710.000 - Km 16+740.000	Yên Vi bridge	33	PCI	RC -
Km 16+740.000 - Km 17+850.000	Earthwork				
Km 17+850.000 - Km 17+870.000	Hòa Tiến bridge	33	PCI	RC -	
Km 17+870.000 - Km 19+140.000	Earthwork				

Source: ITS Integration Project (SAPI) Study Team

**Table 2.7 Detailed Conditions of Road Sections (4)**

<b>Nội Bài - Việt Trì expressway</b>	Km 19+140.000 - Km 19+240.000	Trác Bút bridge	33	PCI	RC - Double
	Km 19+240.000 - Km 21+260.000	Earthwork			
	Km 21+260.000 - Km 21+290.000	Trung Nghĩa bridge	33	PCI	RC -
	Km 21+290.000 - Km 25+060.000	Earthwork			
	Km 25+060.000 - Km 25+420.000	Đồng Yên bridge	33	PCI	RC - Double
	Km 25+420.000 - Km 28+660.000	Earthwork			
	Km 28+660.000 - Km 29+020.000	Đào Xá bridge	33	PCI	RC - Double
	Km 29+020.000 - Km 29+580.000	Earthwork			
	Km 29+580.000 - Km 30+240.000	Xuân Ổ bridge	33	PCI	RC - Double
	Km 0+000.000 - Km 1+880.000	Earthwork			
	Km 1+880.000 - Km 1+920.000	Kim Anh bridge	N		Single
	Km 1+920.000 - Km 3+040.000	Earthwork			
	Km 3+040.000 - Km 3+060.000	TL402 bridge	N		Single
	Km 3+060.000 - Km 4+340.000	Earthwork			
	Km 4+340.000 - Km 4+520.000	Trung Kien bridge	N		Double
	Km 4+520.000 - Km 7+320.000	Earthwork			
	Km 7+320.000 - Km 7+436.857	Dại Duong bridge	N		Double
	Km 7+436.857 - Km 7+620.000	Earthwork			
	Km 7+620.000 - Km 7+700	Xuan Huong bridge	N		Double
	Km 7+700 - Km 7+820.000	Earthwork			
	Km 7+820.000 - Km 7+890	Nguyen Tat Thanh bridge	N		Double
	Km 7+890 - Km 8+750.000	Earthwork			
	Km 8+750.000 - Km 8+770	TL301 bridge	N		Single
	Km 8+770 - Km 10+630.000	Earthwork			
	Km 10+630.000 - Km 10+770.000	Tan Loi bridge	N		Double
	Km 10+770.000 - Km 13+940.000	Earthwork			
	Km 13+940.000 - Km 14+100.000	Ba Thien bridge	N		Double
	Km 14+100.000 - Km 15+030.000	Earthwork			
	Km 15+030.000 - Km 15+160.000	Bon bridge	N		Single
	Km 15+160.000 - Km 15+990.000	Earthwork			
	Km 15+990.000 - Km 16+010.000	TL302B bridge	N		Single
	Km 16+010.000 - Km 19+000.000	Earthwork			
	Km 19+000.000 - Km 19+240.000	Tam Long - Thien Khe bridge	N		Double
	Km 19+240.000 - Km 19+730.000	Earthwork			
	Km 19+730.000 - Km 19+750.000	TL302C bridge	N		Single
	Km 19+750.000 - Km 21+125.000	Earthwork			
	Km 21+125.000 - Km 21+175.000	Cam I bridge	N		Double
	Km 21+175.000 - Km 21+893.000	Earthwork			
	Km 21+893.000 - Km 21+928.000	Cam II bridge	N		Single
	Km 21+928.000 - Km 22+470.000	Earthwork			
Km 22+470.000 - Km 22+490.000	TL302C II bridge	N		Single	
Km 22+490.000 - Km 23+880.000	Earthwork				
Km 23+880.000 - Km 23+900.000	Army I bridge	N		Single	
Km 23+900.000 - Km 24+890.000	Earthwork				
Km 24+890.000 - Km 25+000.000	QL2B bridge	N		Single	
Km 25+000.000 - Km 26+960.000	Earthwork				
Km 26+960.000 - Km 27+070.000	Army II bridge	N		Double	
Km 27+070.000 - Km 27+985.000	Earthwork				
Km 27+985.000 - Km 28+040.000	Army III bridge	N		Double	
Km 28+040.000 - Km 29+130.000	Earthwork				
Km 29+130.000 - Km 29+280.000	TL310 bridge	N		Double	
Km 29+280.000 - Km 31+050.000	Earthwork				
Km 31+050.000 - Km 31+090.000	Ben Tre bridge	N		Single	
Km 31+090.000 - Km 31+237.000	Earthwork				
Km 31+237.000 - Km 31+255.000	Tan Dung bridge	N		Single	
Km 31+255.000 - Km 31+400.000	Earthwork				
Km 31+400.000 - Km 31+590.000	Muong Noi bridge	N		Double	

Source: ITS Integration Project (SAPI) Study Team



**Table 2.8 Detailed Conditions of Road Sections (5)**

Km 31+590.000 - Km 33+170.000	Earthwork			
Km 33+170.000 - Km 33+190.000	TL306 I bridge	N		Single
Km 33+190.000 - Km 33+276.000	Earthwork			
Km 33+276.000 - Km 33+310.000	Muong Dao bridge	N		Single
Km 33+310.000 - Km 34+470.000	Earthwork			
Km 34+470.000 - Km 34+490.000	TL309 bridge	N		Single
Km 34+490.000 - Km 35+140.000	Earthwork			
Km 35+140.000 - Km 35+310.000	Ben Gao bridge	N		Double
Km 35+310.000 - Km 37+940.000	Earthwork			
Km 37+940.000 - Km 37+960.000	TL305 bridge	N		Single
Km 37+960.000 - Km 38+440.000	Earthwork			
Km 38+440.000 - Km 38+460.000	Song Dao bridge	N		Single
Km 38+460.000 - Km 40+850.000	Earthwork			
Km 40+850.000 - Km 40+870.000	TL305C bridge	N		Single
Km 40+870.000 - Km 45+820.000	Earthwork			
Km 45+820.000 - Km 45+840.000	TL306 II bridge	N		Single
Km 45+840.000 - Km 47+770.000	Earthwork			
Km 47+770.000 - Km 48+590.000	Lo River bridge	N		Double
Km 48+590.000 - Km 60+886.250	Earthwork			
Km 60+886.250 - Km 61+060	Bai Bang bridge	N		Double
Km 61+060 - Km 61+560	Earthwork			
Km 61+560 - Km 61+610.000	Gam Phu bridge	N		Double
Km 61+610.000 - Km 63+520.000	Earthwork			
Km 63+520.000 - Km 63+540.000	Lung Thuong bridge	N		Single
Km 63+540.000 - Km 64+070.000	Earthwork			
Km 64+070.000 - Km 64+090.000	TL320B Bridge	N		Single
Km 64+090.000 - Km 65+400.000	Earthwork			
Km 65+400.000 - Km 65+680.000	Ho Chi Minh bridge	N		Double
Km 65+680.000 - Km 66+915.000	Earthwork			
Km 66+915.000 - Km 66+990.000	Xuan Thanh bridge	N		Double
Km 66+990.000 - Km 67+640.000	Earthwork			
Km 67+640.000 - Km 67+800.000	TL315B Bridge	N		Single
Km 67+800.000 - Km 70+225.000	Earthwork			
Km 70+225.000 - Km 70+250.000	PhaiDin Bridge	N		Single
Km 70+250.000 - Km 72+570.000	Earthwork			
Km 72+570.000 - Km 72+590.000	TL320C Bridge	N		Single
Km 72+590.000 - Km 77+080.000	Earthwork			
Km 77+080.000 - Km 77+420.000	National railway bridge	N		Double
Km 77+420.000 - Km 77+650.000	Earthwork			
Km 77+650.000 - Km 78+515.000	Red river bridge	N		Double
Km 78+515.000 - Km 81+820.000	Earthwork			

Source: ITS Integration Project (SAPI) Study Team



**Table 2.9 Interchanges and Tollgates**

Section	Station	Name of interchange	Type of interchange	Number of tollgate lanes	Number of IC	Number of tollgate
<b>Ring road 3</b>	Km 22+690.000	Nút giao Trung Hòa	Diamond		7	1
	Km 23+855.000					
	Km 24+655.000	Nút giao Thanh Xuân	Diamond			
	Km 25+700.000					
	Km 0+700.000	Nút giao Pháp Vân	Double Trumpet			
	Km 2+580.000	Nút giao Tam Trinh	Semi Diamond			
	Km 5+360.000	Nút giao Lĩnh Nam	Diamond			
	Km 5+880.000					
	Km 6+60.000	Trạm thu phí Lĩnh Nam	(Barrier Tollgate)	6 (in future)		
Km 9+500.000	Nút giao Bắc Thanh Trì	Folded Diamond				
Km 12+300.000	Nút giao QL.5-S.Đông	Folded Diamond				
<b>Láng - Hòa Lạc Exp</b>	Km 2+725.000	Nút giao Trung Hòa	Semi Diamond		5	0
	Km 5+375.000					
	Km 5+875.000	Nút giao Đại Mỗ	Diamond			
	Km 19+150.000	Nút giao Đồng Mỗ	Ramp			
	Km 29+300.000	Nút giao Phú Cát	Semi Diamond			
Km 29+500.000	Nút giao Hòa Lạc	Cloverleaf				
<b>Pháp Vân - Cầu Giẽ Exp</b>	Km 188+300.000	Trạm thu phí Phương Nhi	(Barrier Tollgate)	18 (in future)	2	3
	Km 192+881.023	Nút giao Khê Hội	6 Ramp Partial Cloverleaf	8 (in future)		
	Km 203+100.000	Nút giao Vạn Điểm	Diamond	8 (in future)		
<b>Cầu Giẽ - Ninh Bình Exp</b>	Km 205+000.000				4	4
	Km 211+860.000	Nút giao Đại Xuyên	Trumpet	6 (in future)		
	Km 217+750.000					
	Km 219+750.000	Nút giao Vực Vòng	Diamond	8 (in future)		
<b>Hà Nội - Bắc Ninh Exp</b>	Km 230+700.000	Nút giao Liêm Tuyền	Diamond	12 (in future)	5	1
	Km 259+500.000	Nút giao Cao Bồ	Folded Diamond	12 (in future)		
	Km 137+850.000	Nút giao Nam Bắc Ninh	Trumpet			
	Km 142+100.000	Nút giao Liên Bảo	Cloverleaf			
	Km 145+100.000	Nút giao Tiên Sơn	Trumpet			
	Km 146+700.000	Nút giao Từ Sơn	Partial Cloverleaf			
<b>Nội Bài - Bắc Ninh Exp</b>	Km 149+200.000	Nút giao Đền Đô	7 Ramp Partial Cloverleaf		3	1
	Km 159+000.000	Trạm thu phí Phúc Lợi	(Barrier Tollgate)	8		
	Km 0+0.000	Nút giao Thang Long - Nội Bài	Double Trumpet			
	Km 8+350.000	Nút giao QL3-Phủ Lỗ	Trumpet			
<b>Nội Bài - Việt Trì Exp</b>	Km 17+20.000	Trạm thu phí Cà Lỗ	(Barrier Tollgate)	6 (in future)	6	7
	Km 20+30.000	Nút giao TL295-Chờ	Partial Cloverleaf			
	Km 8+000.000	Trạm thu phí Tân Dân	(Barrier Tollgate)	8 (in future)		
	Km 14+600.000	Nút giao Bình Xuyên	Trumpet	6 (in future)		
	Km 25+240.000	Nút giao QL2B-Kim Long	Trumpet	4 (in future)		
	Km 39+960.000	Nút giao TL305-Văn Quán	Trumpet	4 (in future)		
	Km 54+640.000	Nút giao QL2-Phủ Ninh	Trumpet	4 (in future)		
Km 66+300.000	Nút giao Hà Lặc	Trumpet	4 (in future)			
Km 79+600.000	Nút giao QL32C-Sai Nga	Trumpet	4 (in future)			
<b>Total</b>					<b>32</b>	<b>17</b>

Source: ITS Integration Project (SAPI) Study Team

## 2.2 Road Traffic

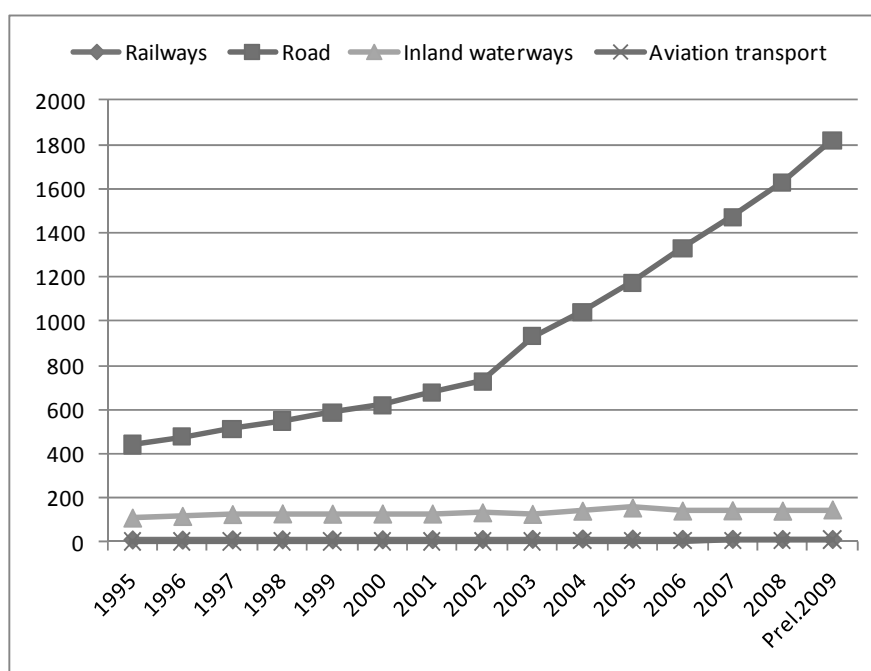
### 1) Overview of Road Traffic in Vietnam

According to statistics of 2009, domestically built automobiles sales is approximately 120,000. Including the number of used cars imported approximately 80,000. Total sales are 200,000 approximately. Sales of motorcycles have been sold approximately 3 million. Like other ASEAN countries, an extremely high ratio of motorcycle.

Number of passengers carried by transport infrastructure (2009), 1818.7 million persons per year by road traffic, 148.2 million persons per year by coastal traffic, 11.0 million persons per year by train, 10.7 million persons per year by air traffic. More than 90% of all depends on road traffic where the overwhelming on road infrastructure.

According to the National Transportation Safety Board, the situation of traffic accidents in 2009, the incidence 12,492 cases (3% down yr/yr), fatalities 1,516 persons (0.7% down yr/yr), injuries 7,914 persons (1.9% down yr/yr). The situation has improved over last year however, the number of deaths per million population of 132 persons. It is 3.4 times compare with 38.4 persons in case of Japan.

**Figure 2.7 Number of passengers carried by transport infrastructure in Vietnam**



Source: General Statistic Office of Vietnam

Under these circumstances, the construction of expressway has been progress rapidly. However, given the high incidence of traffic accidents and motorcycle overwhelming contamination rate, are expected to frequent traffic congestion, traffic restriction and traffic accidents and other factors.

In fact, has been in service for some sections started in February 2010 - on the expressway between HCMC and TrungLuong was in service two weeks later, approximately 400 incidents occur such as punk, stall, rollover accidents.

Thereafter, the percentage of incident occurrence has been reduced. However, 7,208 of traffic incidents are occurred including traffic accidents during 18 months (traffic accident, only 1.56% is occurred on the expressway). In some cases, it is to be cause of traffic congestion.

The other expressway will be serviced in the future, there is concern that a similar situation occurs. To achieve an appropriate road traffic management, information collection and information is required.

**Table 2.10** Statistic data incidents need rescuing

TT	Items	Unit	Total	Bus	Truck
1	Collapse	incident	2.751	946	1.805
2	Breakdown	incident	4.457	2.386	2.071
	<b>Total</b>	<b>incident</b>	<b>7.208</b>	<b>3.332</b>	<b>3.876</b>

Source: MOT

**Table 2.11** Statistic data traffic accident

TT	Items	Expressway	Connecting roads	
			HCM City Area	Tien Giang Area
1	Overtuned vehicle			
	Number of accidents.	<b>43</b>	0	0
	Number of fatalities	<b>0</b>	0	0
2	Accident fatalities			
	Number of accidents.	<b>08</b>	15	6
	Number of fatalities	<b>21</b>	16	6
3	Vehicles encroach lane, collide			
	Number of accidents.	<b>62</b>	68	4
	Number of fatalities	<b>0</b>	28	3
	<b>Total</b>	<b>113 accidents</b>	<b>83 accidents</b>	<b>10 accidents</b>

Source: MOT

**Figure 2.8** Road traffic condition at National Highway No.5



## 2) Overview of Traffic on Target Road Network

Overview of traffic on the target road network are shown below.

**Table 2.12 Summary of Estimated Traffic Demand by Road Section (1)**

(Unit: Number of vehicle per day)

	Expressway/Section	Passenger Car	Bus	Truck	(Total)
(1)	<b>Ring Road No.3 (Mai Dich – Thanh Tri)</b>				
	<b>Year 2015:</b>				
	NH32 - Lang Hoa Lac	12,800	9,000	10,000	31,800
	Lang Hoa Lac - NH6	19,200	8,800	10,900	38,900
	NH6 - NH1	18,400	7,000	12,100	37,500
	NH1 - New NH1	14,200	4,600	10,700	29,500
	New NH1 - NH5	16,800	6,600	16,500	39,900
	NH5 -	12,400	4,400	17,500	34,300
	<b>Year 2020:</b>				
	NH32 - Lang Hoa Lac	12,600	9,900	10,300	32,800
	Lang Hoa Lac - NH6	20,400	14,700	12,200	47,300
	NH6 - NH1	20,300	13,200	17,500	51,000
	NH1 - New NH1	33,700	5,500	13,200	52,400
	New NH1 - NH5	37,700	8,000	20,700	66,400
NH5 -	27,200	6,000	25,100	58,300	
(2)	<b>Lang – Hoa Lac</b>				
	<b>Year: 2015:</b>				
	RR No.3 - Nhue River Bridge	6,100	800	4,000	10,900
	Nhue River Bridge - Road No. 70	10,800	1,400	7,100	19,300
	Outside Road No. 70	22,900	2,900	15,100	40,900
	Outside RR No.4	22,900	2,900	15,100	40,900
	<b>Year 2020:</b>				
	RR No.3 - Nhue River Bridge	6,600	800	4,400	11,800
	Nhue River Bridge - Road No. 70	9,800	1,200	6,500	17,500
	Outside Road No. 70	11,300	1,400	7,400	20,100
Outside RR No.4	22,500	2,800	14,800	40,100	
(3)	<b>Hanoi – Bac Ninh</b>				
	<b>Year: 2015:</b>				
	NH No.5 to IC15	11,200	4,100	10,400	25,700
	IC15 to IC14	16,100	5,600	11,000	32,700
	IC14 to IC13	16,100	5,600	12,000	33,700
	IC13 to IC12 (NH No.18)	6,400	2,500	5,900	14,800
	<b>Year 2020:</b>				
	NH No.5 to IC15	14,400	4,700	13,200	32,300
	IC15 to IC14	20,200	6,500	12,700	39,400
IC14 to IC13	20,200	6,500	15,900	42,600	
IC13 to IC12 (NH No.18)	8,800	2,800	9,200	20,800	

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: Estimated based on study reports of each project or interview at project offices

The estimation years are Year 2015 and year 2020

Unit: Number of vehicle per day

**Table 2.13 Summary of Estimated Traffic Demand by Road Section (2)**

(Unit: Number of vehicle per day)

	Expressway/Section	Passenger Car	Bus	Truck	(Total)
<b>(4)</b>	<b>Noi Bai – Bac Ninh</b>				
	<b>Year: 2015:</b>				
	Noi Bai - NH3	8,000	1,400	9,300	18,700
	NH3 - NH295	4,400	700	5,100	10,200
	NH295 - New NH1	3,400	600	4,000	8,000
	<b>Year: 2020:</b>				
	Noi Bai - NH3	12,600	2,100	13,600	28,300
	NH3 - NH295	7,100	1,200	7,600	15,900
<b>(5)</b>	<b>Noi Bai – Lao Cai</b>				
	<b>Year: 2015:</b>				
	Noi Bai - Viet Tri	7,600	500	500	8,600
	Viet Tri - Yen Bai	1,900	500	1,500	3,900
	Yen Bai - Lao Cai	1,800	500	700	3,000
	<b>Year: 2020:</b>				
	Noi Bai - Viet Tri	14,600	600	2,500	17,700
	Viet Tri - Yen Bai	4,100	600	2,000	6,700
<b>(6)</b>	<b>Phap Van – Cau Gie</b>				
	<b>Year 2015:</b>				
	Phap Van – Thuong Tin	9,400	15,800	8,900	34,100
	Thuong Tin – Cau Gie	9,400	15,800	9,700	34,900
	<b>Year 2020:</b>				
	Phap Van – Thuong Tin	15,500	19,500	10,200	45,200
Thuong Tin – Cau Gie	14,700	19,900	12,700	47,300	
<b>(7)</b>	<b>Cau Gie – Ninh Binh</b>				
	<b>Year: 2015:</b>				
	Cau Gie – Phu Ly	14,300	24,100	14,800	53,200
	Phu Ly – Ninh Binh	8,100	13,700	8,400	30,200
	<b>Year 2020:</b>				
	Cau Gie – Phu Ly	30,800	41,800	26,700	99,300
Phu Ly – Ninh Binh	18,300	24,800	15,900	59,000	

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: Estimated based on study reports of each project or interview at project offices

The estimation years are Year 2015 and year 2020

Unit: Number of vehicle per day

Traffic conditions of each road section of the target road network are to be summarised as shown in the following Tables.

**Table 2.14 Traffic Conditions in Mai Dich – Thanh Tri Section**

**(1) Ring Road No.3 (Mai Dich - Thanh Tri)**

		Passenger Car	Bus	Truck
Year : 2015	NH32 - Lang Hoa Lac	12,800	9,000	10,000
	Lang Hoa Lac - NH6	19,200	8,800	10,900
	NH6 - NH1	18,400	7,000	12,100
	NH1 - New NH1	14,200	4,600	10,700
	New NH1 - NH5	16,800	6,600	16,500
	NH5 -	12,400	4,400	17,500
	Average	15,633	6,733	12,950
Year : 2020	NH32 - Lang Hoa Lac	12,600	9,900	10,300
	Lang Hoa Lac - NH6	20,400	14,700	12,200
	NH6 - NH1	20,300	13,200	17,500
	NH1 - New NH1	33,700	5,500	13,200
	New NH1 - NH5	37,700	8,000	20,700
	NH5 -	27,200	6,000	25,100
	Average	25,317	9,550	16,500

**(1) Ring Road No.3 (Mai Dich - Thanh Tri)**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 4	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	NH32 - Lang Hoa Lac	12,800	22,500	20,000	55,300	7,189	1,797	1,078
	Lang Hoa Lac - NH6	19,200	22,000	21,800	63,000	8,190	2,048	1,229
	NH6 - NH1	18,400	17,500	24,200	60,100	7,813	1,953	1,172
	NH1 - New NH1	14,200	11,500	21,400	47,100	6,123	1,531	918
	New NH1 - NH5	16,800	16,500	33,000	66,300	8,619	2,155	1,293
	NH5 -	12,400	11,000	35,000	58,400	7,592	1,898	1,139
	Average	15,633	16,833	25,900	58,367	7,588	1,897	1,138
Year : 2020	NH32 - Lang Hoa Lac	12,600	24,750	20,600	57,950	7,534	1,883	1,130
	Lang Hoa Lac - NH6	20,400	36,750	24,400	81,550	10,602	2,650	1,590
	NH6 - NH1	20,300	33,000	35,000	88,300	11,479	2,870	1,722
	NH1 - New NH1	33,700	13,750	26,400	73,850	9,601	2,400	1,440
	New NH1 - NH5	37,700	20,000	41,400	99,100	12,883	3,221	1,932
	NH5 -	27,200	15,000	50,200	92,400	12,012	3,003	1,802
	Average	25,317	23,875	33,000	82,192	10,685	2,671	1,603

**Table 2.15 Traffic Conditions in Lang – Hoa Lac Section**

**(2) Lang - Hoa Lac**

		Passenger Car	Bus	Truck
Year : 2015	RR No.3 - Nhue River Bridge	6,100	800	4,000
	Nhue River Bridge - Road No.70	10,800	1,400	7,100
	Outside Road No.70	22,900	2,900	15,100
	Outside RR No.4	22,900	2,900	15,100
	Average	15,675	2,000	10,325
Year : 2020	RR No.3 - Nhue River Bridge	6,600	800	4,400
	Nhue River Bridge - Road No.70	9,800	1,200	6,500
	Outside Road No.70	11,300	1,400	7,400
	Outside RR No.4	22,500	2,800	14,800
	Average	12,550	1,550	8,275

**(2) Lang - Hoa Lac**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 6
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total		
Year : 2015	RR No.3 - Nhue River Bridge	6,100	2,000	8,000	16,100	2,093	349
	Nhue River Bridge - Road No.70	10,800	3,500	14,200	28,500	3,705	618
	Outside Road No.70	22,900	7,250	30,200	60,350	7,846	1,308
	Outside RR No.4	22,900	7,250	30,200	60,350	7,846	1,308
	Average	15,675	5,000	20,650	41,325	5,372	895
Year : 2020	RR No.3 - Nhue River Bridge	6,600	2,000	8,800	17,400	2,262	377
	Nhue River Bridge - Road No.70	9,800	3,000	13,000	25,800	3,354	559
	Outside Road No.70	11,300	3,500	14,800	29,600	3,848	641
	Outside RR No.4	22,500	7,000	29,600	59,100	7,683	1,281
	Average	12,550	3,875	16,550	32,975	4,287	714

**Table 2.16 Traffic Conditions in Ha Noi – Bac Ninh Section**

**(3) HaNoi - Bac Ninh**

		Passenger Car	Bus	Truck
Year : 2015	NH No.5 to IC 15	11,200	4,100	10,400
	IC15 to IC14	16,100	5,600	11,000
	IC14 to IC13	16,100	5,600	12,000
	IC13 to IC12 (NH No.18)	6,400	2,500	5,900
	Average	12,450	4,450	9,825
Year : 2020	NH No.5 to IC 15	14,400	4,700	13,200
	IC15 to IC14	20,200	6,500	12,700
	IC14 to IC13	20,200	6,500	15,900
	IC13 to IC12 (NH No.18)	8,800	2,800	9,200
	Average	15,900	5,125	12,750

**(3) HaNoi - Bac Ninh**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 4	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	NH No.5 to IC 15	11,200	10,250	20,800	42,250	5,493	1,373	824
	IC15 to IC14	16,100	14,000	22,000	52,100	6,773	1,129	677
	IC14 to IC13	16,100	14,000	24,000	54,100	7,033	1,172	703
	IC13 to IC12 (NH No.18)	6,400	6,250	11,800	24,450	3,179	530	318
	Average	12,450	11,125	19,650	43,225	5,619	937	562
Year : 2020	NH No.5 to IC 15	14,400	11,750	26,400	52,550	6,832	1,139	683
	IC15 to IC14	20,200	16,250	25,400	61,850	8,041	1,340	804
	IC14 to IC13	20,200	16,250	31,800	68,250	8,873	1,479	887
	IC13 to IC12 (NH No.18)	8,800	7,000	18,400	34,200	4,446	741	445
	Average	15,900	12,813	25,500	54,213	7,048	1,175	705



**Table 2.17 Traffic Conditions in Noi Bai – Bac Ninh Section**

**(4) Noi Bai - Bac Ninh**

		Passenger Car	Bus	Truck
Year : 2015	Noi Bai - NH3	8,000	1,400	9,300
	NH3 - NH295	4,400	700	5,100
	NH295 - New NH1	3,400	600	4,000
		5,267	900	6,133
Year : 2020	Noi Bai - NH3	12,600	2,100	13,600
	NH3 - NH295	7,100	1,200	7,600
	NH295 - New NH1	5,700	1,000	6,100
		8,467	1,433	9,100

**(4) Noi Bai - Bac Ninh**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 4	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	Noi Bai - NH3	8,000	3,500	18,600	30,100	3,913	978	587
	NH3 - NH295	4,400	1,750	10,200	16,350	2,126	531	319
	NH295 - New NH1	3,400	1,500	8,000	12,900	1,677	419	252
		5,267	2,250	12,267	19,783	2,572	643	386
Year : 2020	Noi Bai - NH3	12,600	5,250	27,200	45,050	5,857	1,464	878
	NH3 - NH295	7,100	3,000	15,200	25,300	3,289	822	493
	NH295 - New NH1	5,700	2,500	12,200	20,400	2,652	663	398
		8,467	3,583	18,200	30,250	3,933	983	590

**Table 2.18 Traffic Conditions in Noi Bai – Lao Cai Section**

**(5) Noi Bai - Lao Cai**

		Passenger Car	Bus	Truck
Year : 2015	Noi Bai - Viet Tri	7,600	500	500
	Viet Tri - Yen Bai	1,900	500	1,500
	Yen Bai - Lao Cai	1,800	500	700
		3,767	500	900
Year : 2020	Noi Bai - Viet Tri	14,600	800	2,500
	Viet Tri - Yen Bai	4,100	600	2,000
	Yen Bai - Lao Cai	3,900	700	1,000
		7,533	633	1,833

**(5) Noi Bai - Lao Cai**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 6	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	Noi Bai - Viet Tri	7,600	1,250	1,000	9,850	1,281	213	128
	Viet Tri - Yen Bai	1,900	1,250	3,000	6,150	800	133	80
	Yen Bai - Lao Cai	1,800	1,250	1,400	4,450	579	96	58
		3,767	1,250	1,800	6,817	886	148	89
Year : 2020	Noi Bai - Viet Tri	14,600	1,500	5,000	21,100	2,743	457	274
	Viet Tri - Yen Bai	4,100	1,500	4,000	9,600	1,248	208	125
	Yen Bai - Lao Cai	3,900	1,750	2,000	7,650	995	166	99
		7,533	1,583	3,667	12,783	1,662	277	166

**Table 2.19 Traffic Conditions in Phap Van – Cau Gie Section**

**(6) Phap Van - Cau Gie**

		Passenger Car	Bus	Truck
Year : 2015	Phap Van - Thuong Tin	9,400	15,800	8,900
	Thuong Tin - Cau Gie	9,400	15,800	9,700
		9,400	15,800	9,300
Year : 2020	Phap Van - Thuong Tin	15,500	19,500	10,200
	Thuong Tin - Cau Gie	14,700	19,900	12,700
		15,100	19,700	11,450

**(6) Phap Van - Cau Gie**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 6	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	Phap Van - Thuong Tin	9,400	39,500	17,800	66,700	8,671	1,445	867
	Thuong Tin - Cau Gie	9,400	39,500	19,400	68,300	8,879	1,480	888
		9,400	39,500	18,600	67,500	8,775	1,463	878
Year : 2020	Phap Van - Thuong Tin	15,500	48,750	20,400	84,650	11,005	1,834	1,100
	Thuong Tin - Cau Gie	14,700	49,750	25,400	89,850	11,681	1,947	1,168
		15,100	49,250	22,900	87,250	11,343	1,890	1,134

**Table 2.20 Traffic Conditions in Ha Cau Gie – Ninh Binh Section**

**(7) Cau Gie - Ninh Binh**

		Passenger Car	Bus	Truck
Year : 2015	Cau Gie - Phu Ly	14,300	24,100	14,800
	Phu Ly - Ninh Binh	8,100	13,700	8,400
		11,200	18,900	11,600
Year : 2020	Cau Gie - Phu Ly	30,800	41,800	26,700
	Phu Ly - Ninh Binh	18,300	24,800	15,900
		24,550	33,300	21,300

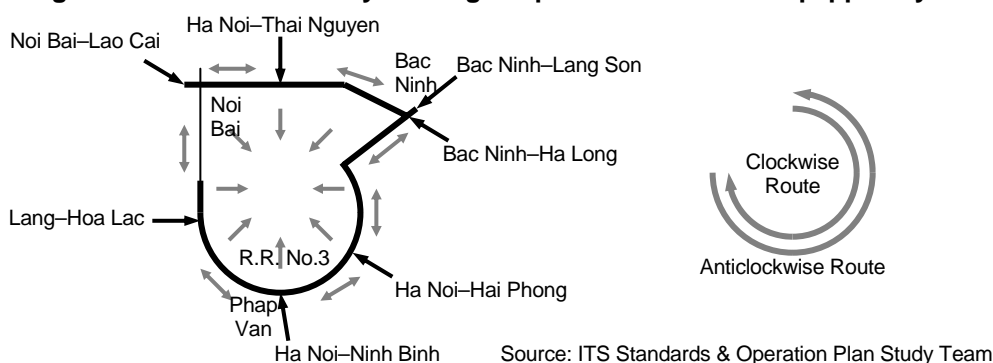
**(7) Cau Gie - Ninh Binh**

		Traffic Volume of converted to Passenger Car				Traffic Volume on Peak hour 0.13	Traffic Volume per Lane 6	Reduced Traffic Volume by 0.60
		Passenger Car 1.00	Bus 2.50	Truck 2.00	Total			
Year : 2015	Cau Gie - Phu Ly	14,300	60,250	29,600	104,150	13,540	2,257	1,354
	Phu Ly - Ninh Binh	8,100	34,250	16,800	59,150	7,690	1,282	769
		11,200	47,250	23,200	81,650	10,615	1,769	1,061
Year : 2020	Cau Gie - Phu Ly	30,800	104,500	53,400	188,700	24,531	4,089	2,453
	Phu Ly - Ninh Binh	18,300	62,000	31,800	112,100	14,573	2,429	1,457
		24,550	83,250	42,600	150,400	19,552	3,259	1,955

### 3) Overview of Traffic on Ring-shaped Road Network in Target Road Network

The target road network of the Study includes a ring-shaped road network as shown below. It is useful for traffic information/control and smooth traffic to install roadside equipment along the ring-shaped road network shown in the figures below. The installed equipment allows to disseminate information on incident occurrences or traffic congestion to the through traffic and the traffic flows into Ha Noi City from the radial roads. By this means, it becomes possible for drivers to select a clockwise or anticlockwise driving route or an exit interchange appropriately and to avoid obstructions.

**Figure 2.9 Route Selectivity on Ring-shaped Road Network Equipped by ITS**



In the beginning of the Study, a traffic survey is conducted on the ring-shaped road network to examine the features of the traffic in the Ha Noi Area, especially on the target network.

Purpose of the traffic survey is evaluated the traffic condition on the existing roads in study area. Base on the results of site survey, data will be analysed to calculate the duration time, average speed on the way. Therefore evaluated the advantage and conveniences of existing traffic network.

The traffic survey was conducted simultaneously at the same time for all selected roads in the study area. Selected time defined as the time interval during peak hours every day (from 7:30 am to 9:00 am in the morning and from 4:00 pm to 6:00 pm in the afternoon).

**Figure 2.10 Start point for traffic survey**



**Figure 2.11 One of end points for the traffic survey**



Selected roads for traffic survey including:

- (1) Section from Noi Bai - NH.18 interchange follow the NH.18 direction, to NH.1, to Phap Van interchange and comeback.
- (2) Section from Noi Bai – NH.18 interchange follow the RR.3 direction, to Mai Dich fly over, Thanh Tri Bridge to NH.5 fly over and comeback.
- (3) Section from Noi Bai – NH.18 interchange to Thang Long bridge, follow Yen Phu dam, to Tran Quang Khai street, to Thanh Tri bridge to NH.5 fly over and comeback.

**(1) Survey method:**

Means using for traffic survey are cars, running along the intended journey in a way that they are doing. That is completely natural form, without the intervention or be dominated by any subjective opinion.

**(a) Equipments for Survey**

- Motorized vehicles (Car) also satisfy the criteria for exploitation (one vehicle / travel).
- Drivers know well about the travel (one driver / vehicle).
- Engineers have responsible for survey (2 engineer / travel).
- The Map with clear journey for survey, mark the start position and end position and particular works constructed on it.
- GPS Equipment have navigation monitoring function, can record the data of journey, and can export the data to computer to analysis and calculate.
- Watches.
- The computer have setup professional softwares.

**(b) Report about situation in Survey Routes:**

**Route 1: Noi Bai - NH18 - NH1 – Phap Van reverse (Total Distance: 65 km)**

**Existing condition:**

Carrageway of NH.18 from Noi Bai to Bac Ninh have 4 lanes for motozied and 2 lanes for motors, allowed average speed now is from 60 – 80 km/h (infact can be higher).

**Existing condition:**

Expressway section along NH 18 (Ha Noi – Bac Ninh) consist of 4 motozied lanes and 2 motorcycle lanes allowed average speed now is from 60 – 80 km/h (infact can be higher). This is the section fully controlled of traffic for crossroad and interchanges. All the section is embankment, in good condition. Traffic safety system, signs and mark lines are remain and easy to be insight, in proper arrangement. Although the survice quality of the section is in such good condition, the traffic volume is quite small (about vehicle/day), mostly inter-city buses, small trucks. The component of vehicle is not complicated because of no bicycle or other non-motorized vehicles, and few motorbikes running on the section. Its easy to recognized that, the section is far away from residential area and the services like petrol stations, rest area, garage, ... are seldom to be found, so drivers hesitate to choose it.

The section from interchange of NH No.18 to Phap Van flyover along NH No.1 is also a good section to be exploited. Traffic volume is quite big and vehicle components are more complicated. On the second survey day, the area was in small rain, wet pavement. Vehicles can still move with speed of 60-80 km/h. However, due to the rain, slippery pavement, high speed driving, there was an upside down truck incident without human injure.

**Route 2: Noi Bai – Ring road 3 – Phap Van Interchange –QL5 interchange and reverse (Total distance: 43 km)**

**Route situation:**

This route is the ring road 3, the direction in which the media focus on capital and capital away from other provinces. So the flow and composition of the rather complex lineup. Rate of extraction on the journey quite well and the difference changes for each segment on the route.

Clips from Noi Bai to Thang Long Bridge, the means of circulation rather smooth average speed over 60km / h (except through the toll booth north of Thang Long - Noi Bai). Clips from the Thang Long Bridge overpass Mai Dich, vehicle traffic often quite large, but does not happen that the media rules still flow with low speed 20-50km / h.

From bridges to Mai Linh Dam Service, this is the complicated route with cars, many intersections with the inner city roads, the site is under construction so the speed on this segment is quite low (20 - 40km / h) and frequent traffic jams, especially at peak hours.

Clips from Linh Dam to QL5 intersection, take the high road, vehicle components and no stable intersections, thus exploiting the speed over 60km / h.

In a different journey, avoid moving in the high bridge over the French Spirit to Van Dam, showing the rate of extraction is very low, only reaching an average of 20 - 30km / h.

**Route 3: Noi Bai – Yen Phu dyke – Tran Quang Khai – Thanh Tri Bridge – node of national highway 5 and vise versa (total length of route: 42 km)**

**Condition of road section:**

This is the route goes toward the ring road, with the aim of study is sharing traffic volume for ring road 3.

Section from Noi Bai to Thang long bridge and section from Thanh tri bridge to node of

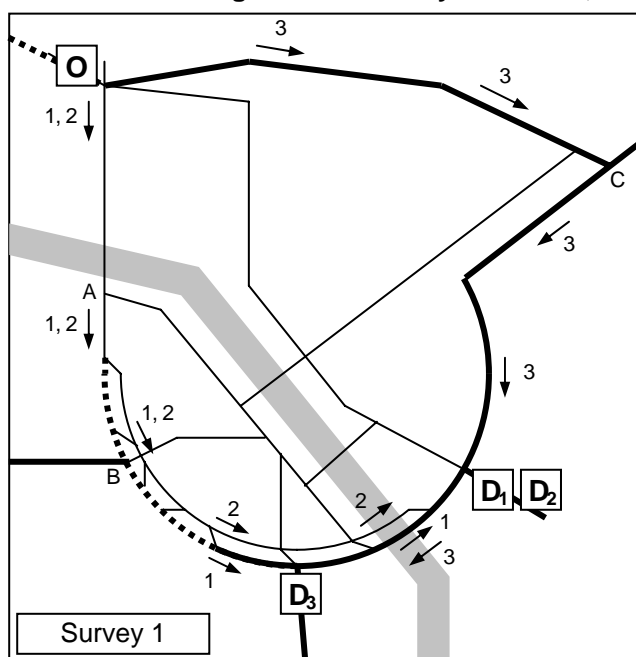
national highway 5 are similar to the route 2.

Section from Thang long bridge to Thanh Tri bridge goes toward Yen phu dyke, Tran Quang Khai dyke which the vehicle is complex but traffic volume is stable and no traffic jam. However, the average speed is only 30 -40 km/h

**(2) Results of Survey in the Morning (8:00 a.m.) of Workdays**

Results of the survey field is shown in the diagram and the following statistics:

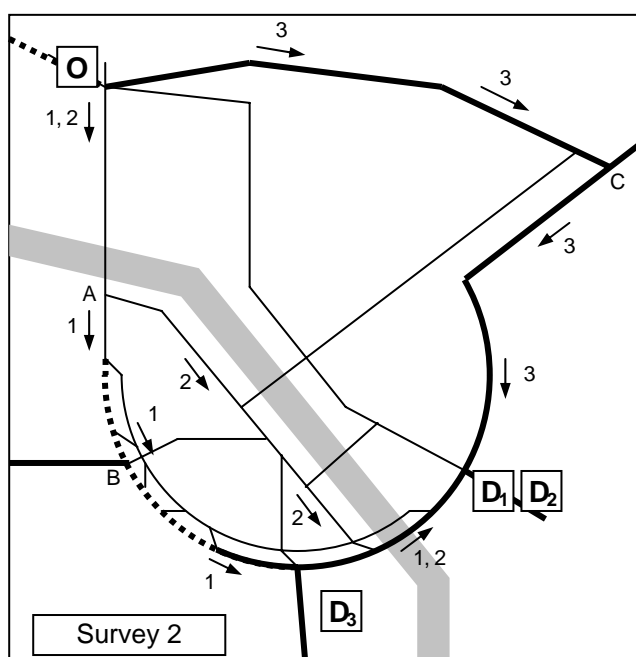
**Figure 2.12 Survey 1: Nov. 22, 2011 – Tuesday, Weather: Sunny**



Survey 1	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	44km	65km
Duration Time	69min	78min	60min
Average Speed	38.6km/h	36.1km/h	63.3km/h
O – A (14km)	46.5km/h	44.5km/h	--
A – B (10km)	31.1km/h	29.6km/h	--
B – D <sub>3</sub> (9km)	28.5km/h	24.3km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	48.9km/h	46.1km/h	--
O – C (30km)	--	--	61.3km/h
C – D <sub>1</sub> (24km)	--	--	71.2km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	--	--	55.2km/h

Where, OA: Section from Noi Bai to Thang Long Bridge  
 AB: Thang Long Bridge to Trung Hoa Interchange  
 BD<sub>3</sub>: Trung Hoa Interchange to Phap Van Interchange  
 D<sub>3</sub>D<sub>1</sub>: Phap Van Interchange to NH5 Interchange  
 OC: Noi Bai – NH18 Interchange to NH18-NH1 Interchange  
 CD<sub>1</sub>: NH18-NH1 Interchange to NH5 Interchange  
 D<sub>1</sub>D<sub>3</sub>: NH5 interchagne to Phap Van Interchange

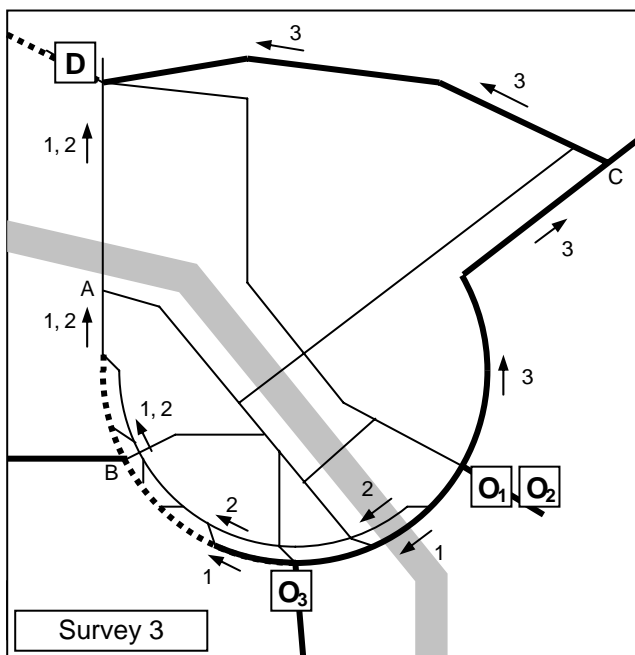
**Figure 2.13 Survey 2: Nov. 23, 2011 – Wednesday, Weather: Cloudy/Rainy**



Survey 2	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	42km	65km
Duration Time	70min	75min	106min
Average Speed	37.4km/h	33.8km/h	36.8km/h
O – A (14km)	42.5km/h	46.3km/h	--
A – B (10km)	31.4km/h	--	--
B – D <sub>3</sub> (9km)	26.6km/h	30.9km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	49.2km/h	--	--
O – C (30km)	--	--	69.7km/h
C – D <sub>1</sub> (24km)	--	--	18.6km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	45km	--	59.5km/h

A serious traffic accident happened near Phu Dong Bridge on the route of Vehicle 3: on C to D1 section at 48.8km distance from O.

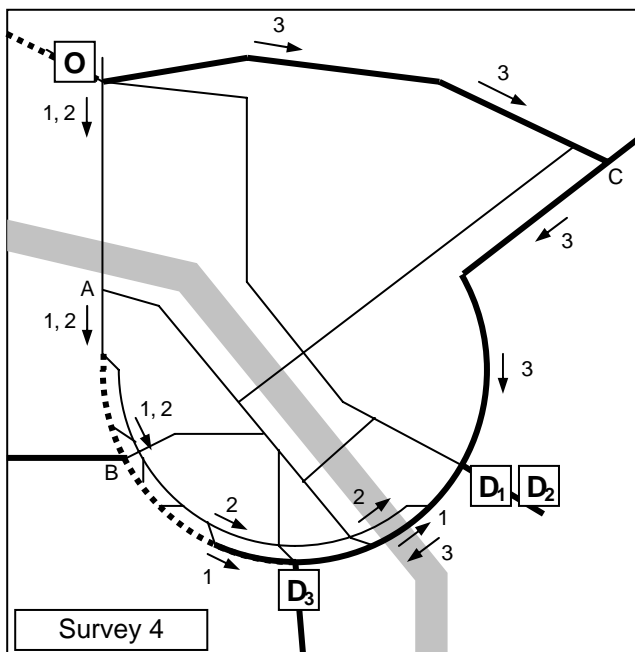
**Figure 2.14 Survey 3: Nov. 24, 2011 – Thursday, Weather: Cloudy**



Survey 3	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	44km	65km
Duration Time	77min	84min	62min
Average Speed	33.6km/h	31.8km/h	63.3km/h
O <sub>1</sub> – O <sub>3</sub> (12km)	59.1km/h	51.6km/h	--
O <sub>3</sub> – B (9km)	25.2km/h	22.4km/h	--
B – A (10km)	21.5km/h	21.1km/h	--
A – D (14km)	44.4km/h	44.7km/h	--
O <sub>3</sub> – O <sub>1</sub> (12km)	--	--	62.8km/h
O <sub>1</sub> – C (24km)	--	--	54.8km/h
C – D (30km)	--	--	70.3km/h

**(3) Results of Survey in the Morning (8:00 a.m.) of Holiday**

**Figure 2.15 Survey 4: Nov. 27, 2011 – Sunday, Weather: Sunny**



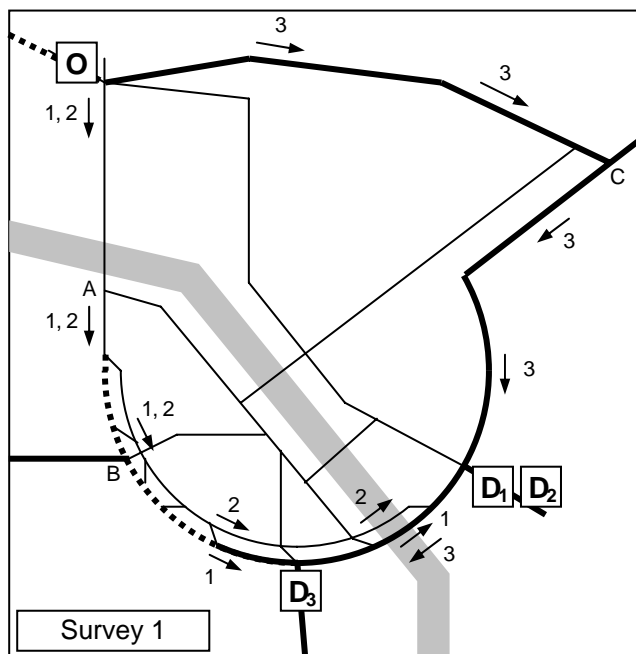
Survey 4	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	44km	65km
Duration Time	61min	67min	52min
Average Speed	43.3km/h	39.9km/h	74.5km/h
O – A (14km)	54.7km/h	55.8km/h	--
A – B (10km)	36.9km/h	36.6km/h	--
B – D <sub>3</sub> (9km)	29.9km/h	24.5km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	53.3km/h	52.5km/h	--
O – C (30km)	--	--	80.9km/h
C – D <sub>1</sub> (24km)	--	--	68.1km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	--	--	70.3km/h



#### (4) Results of Survey in the Afternoon (16:30 p.m.) of Workdays

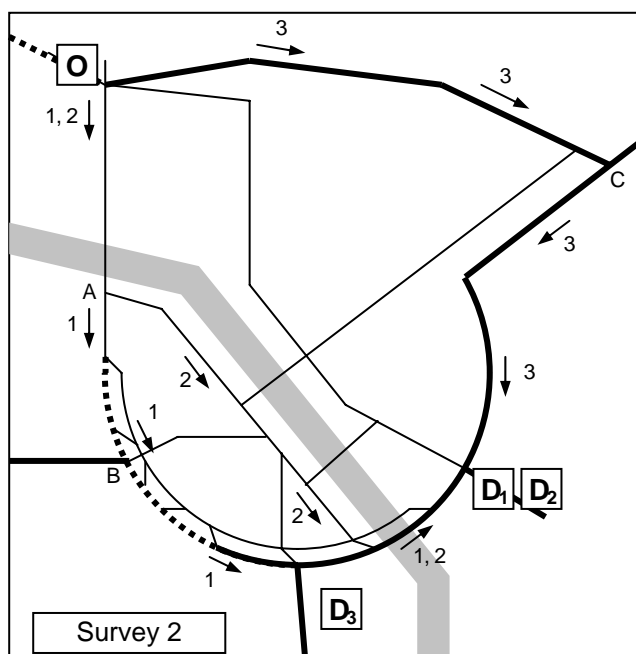
Results of the survey field is shown in the diagram and the following statistics:

**Figure 2.16 Survey 1 : Nov. 22, 2011 – Tuesday, Weather: Cloudy**



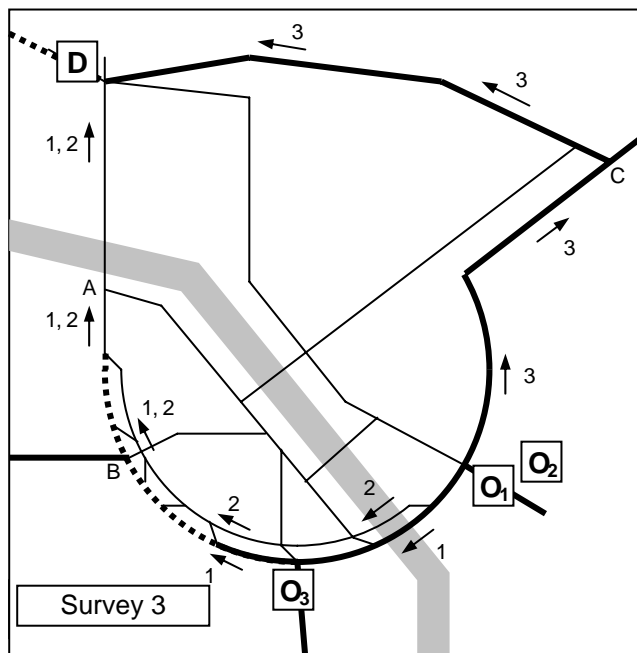
Survey 1	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	44km	65km
Duration Time	85min	103min	67min
Average Speed	30.5km/h	26.2km/h	58.4km/h
O – A (14km)	36.9km/h	37.4km/h	--
A – B (10km)	23.9km/h	24.0km/h	--
B – D <sub>3</sub> (9km)	17.1km/h	13.9km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	56.1km/h	43.5km/h	--
O – C (30km)	--	--	66.4km/h
C – D <sub>1</sub> (24km)	--	--	51.2km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	--	--	53.4km/h

**Figure 2.17 Survey 2 : Nov. 23, 2011 – Wednesday, Weather: Rainy**



Survey 2	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	42km	65km
Duration Time	78min	83min	58min
Average Speed	33.7km/h	30.6km/h	66.7km/h
O – A (14km)	40.9km/h	41.6km/h	--
A – B (10km)	23.8km/h	--	--
B – D <sub>3</sub> (9km)	21.7km/h	27.3km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	66.7km/h	--	--
O – C (30km)	--	--	69.5km/h
C – D <sub>1</sub> (24km)	--	--	58.5km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	--	--	77.0km/h

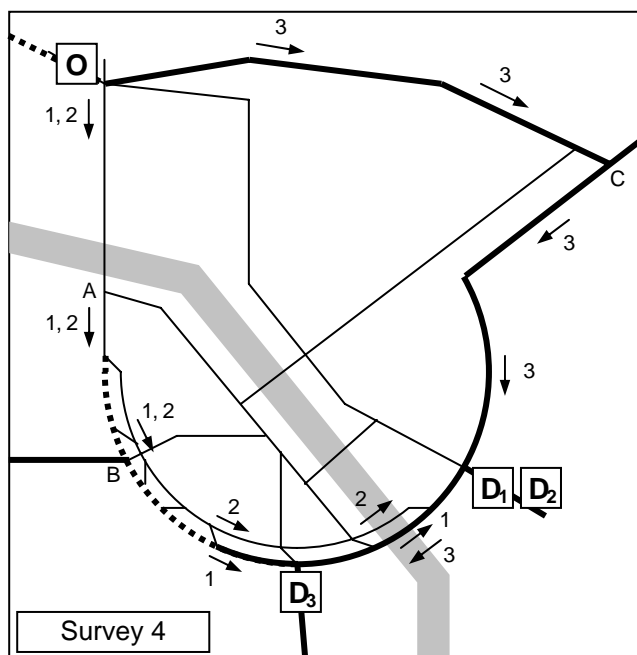
**Figure 2.18 Survey 3 : Nov. 24, 2011 – Thursday, Weather: Sunny**



Survey 3	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	44km	65km
Duration Time	67min	73min	63min
Average Speed	38.2km/h	36.6km/h	62.4km/h
O <sub>1</sub> – O <sub>3</sub> (12km)	59.2km/h	55.6km/h	--
O <sub>3</sub> – B (9km)	29.8km/h	21.3km/h	--
B – A (10km)	26.5km/h	29.2km/h	--
A – D (14km)	46.2km/h	52.9km/h	--
O <sub>3</sub> – O <sub>1</sub> (12km)	--	--	70.7km/h
O <sub>1</sub> – C (24km)	--	--	55.1km/h
C – D (30km)	--	--	65.2km/h

**(5) Results of Survey in the Afternoon (16:30 p.m.) of Holiday**

**Figure 2.19 Survey 4 : Nov. 27, 2011 – Sunday, Weather: Sunny**



Survey 1	Vehicle 1	Vehicle 2	Vehicle 3
Total Drive km	44km	45km	65km
Duration Time	67min	77min	55min
Average Speed	38.6km/h	34.7km/h	70.4km/h
O – A (14km)	48.3km/h	49.4km/h	--
A – B (10km)	30.8km/h	30.9km/h	--
B – D <sub>3</sub> (9km)	27.3km/h	21.9km/h	--
D <sub>3</sub> – D <sub>1</sub> (12km)	55.6km/h	43.2km/h	--
O – C (30km)	--	--	81.3km/h
C – D <sub>1</sub> (24km)	--	--	58.4km/h
D <sub>1</sub> – D <sub>3</sub> (12km)	--	--	69.6km/h

#### (4) Survey Pictures

Figure 2.20 Start Point (Original Point) – Destination



Figure 2.21 Survey Route Map



(a) Route 1

Figure 2.22 Morning Nov. 22, 2011



Figure 2.23 Afternoon Nov. 22, 2011

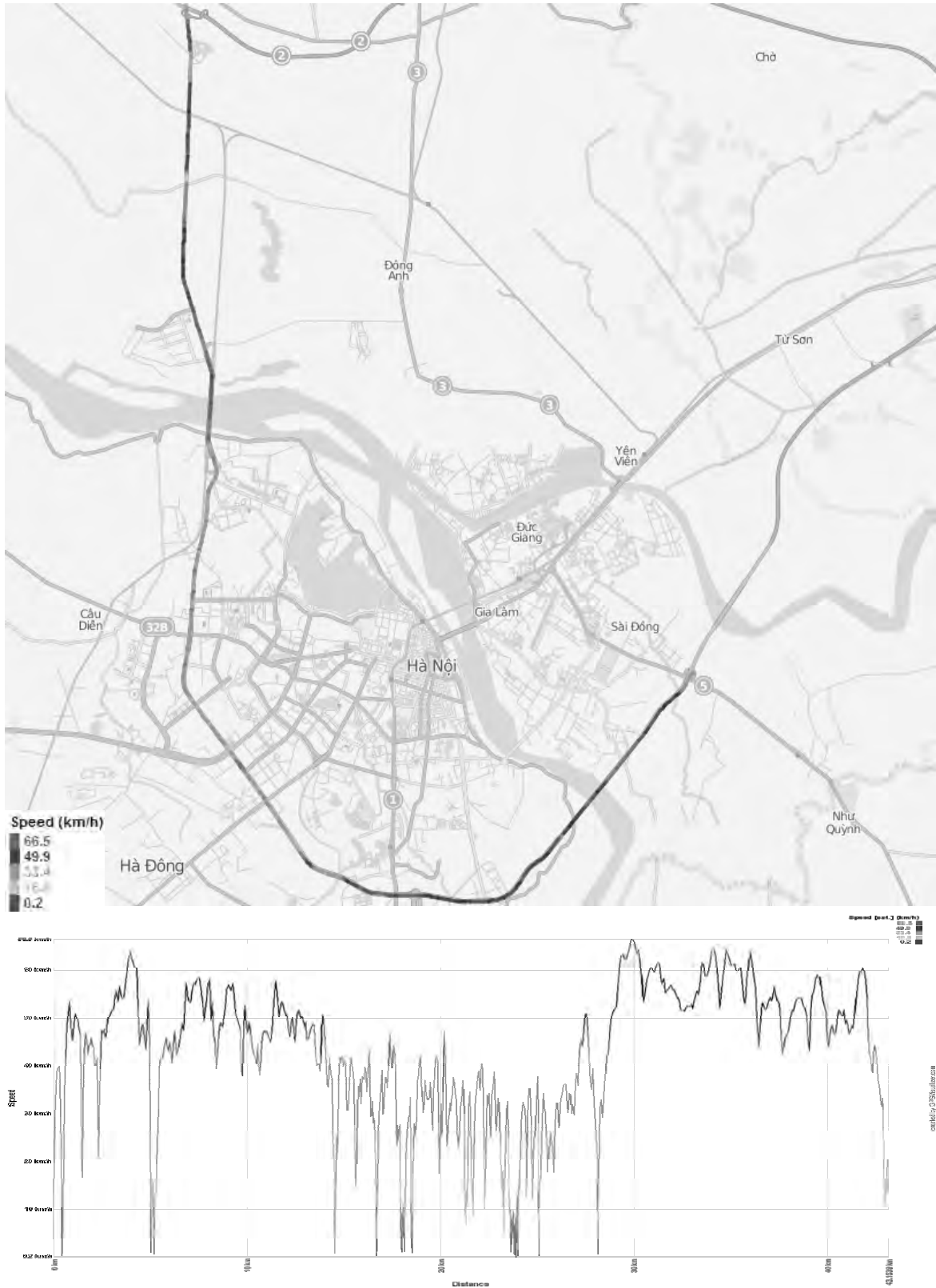


Figure 2.24 Morning Nov. 23, 2011



Figure 2.25 Afternoon Nov. 23, 2011

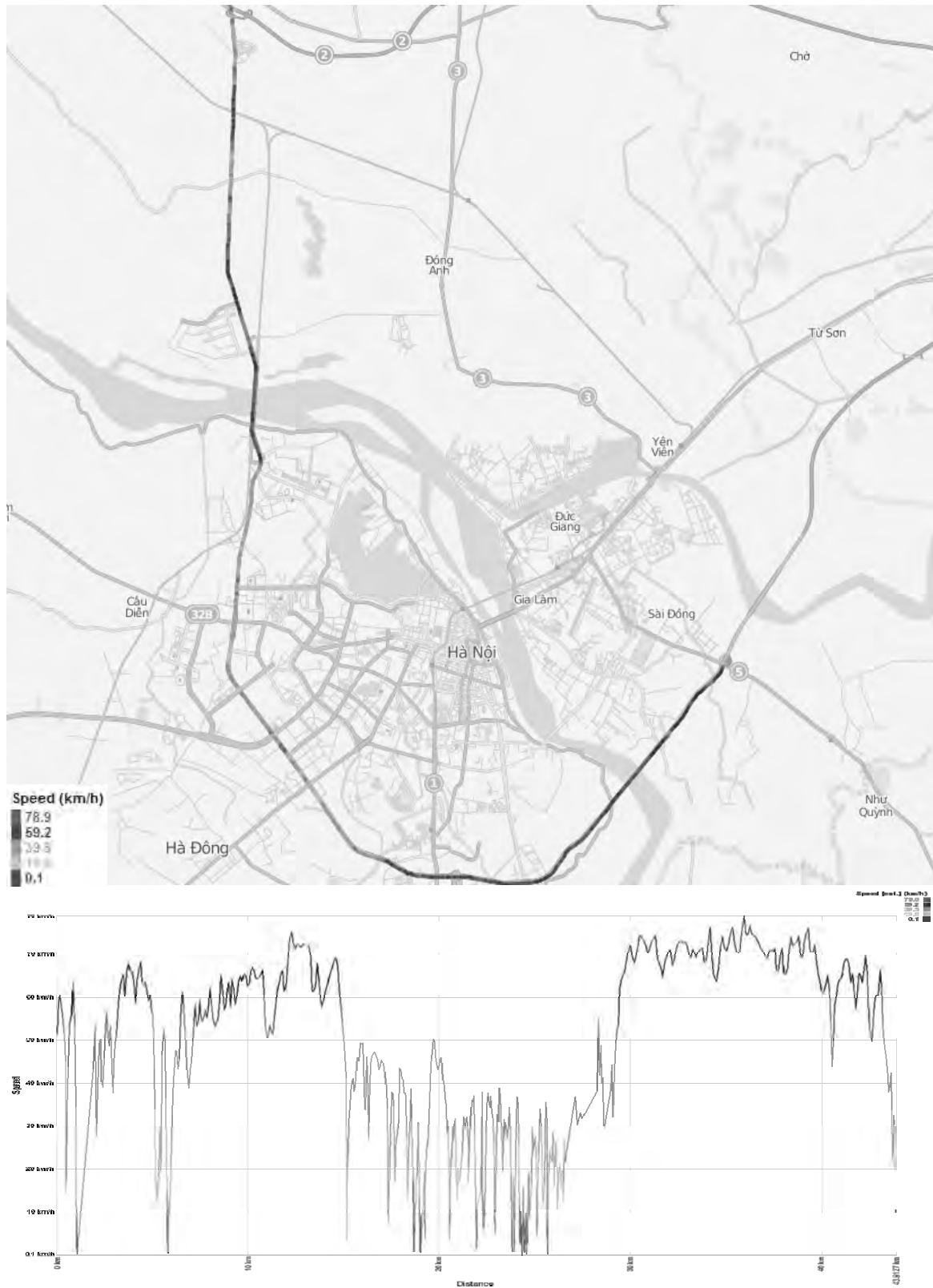




Figure 2.26 Morning Nov. 24, 2011



**Figure 2.27 Afternoon Nov. 24, 2011**

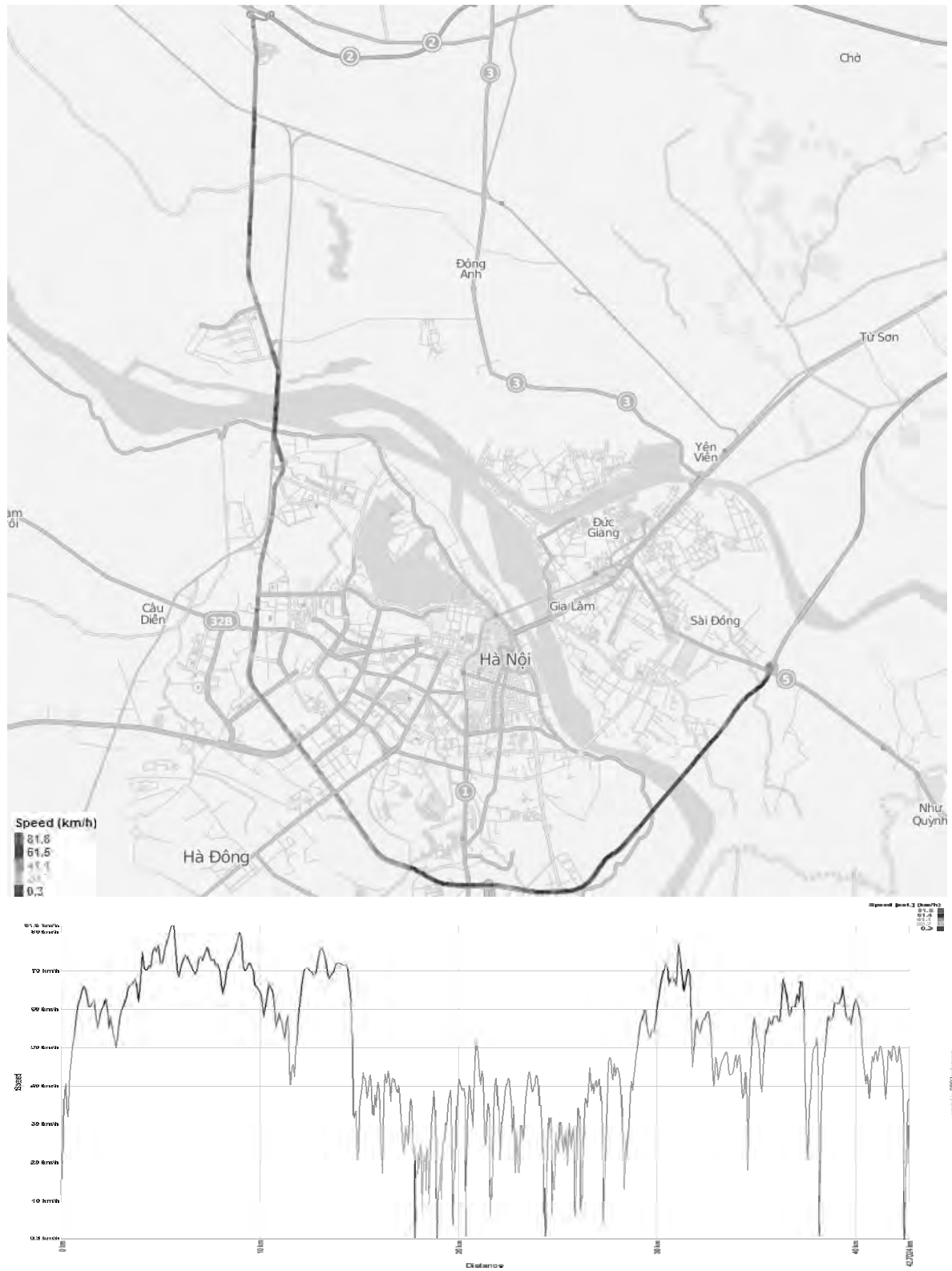


Figure 2.28 Morning Nov. 27, 2011

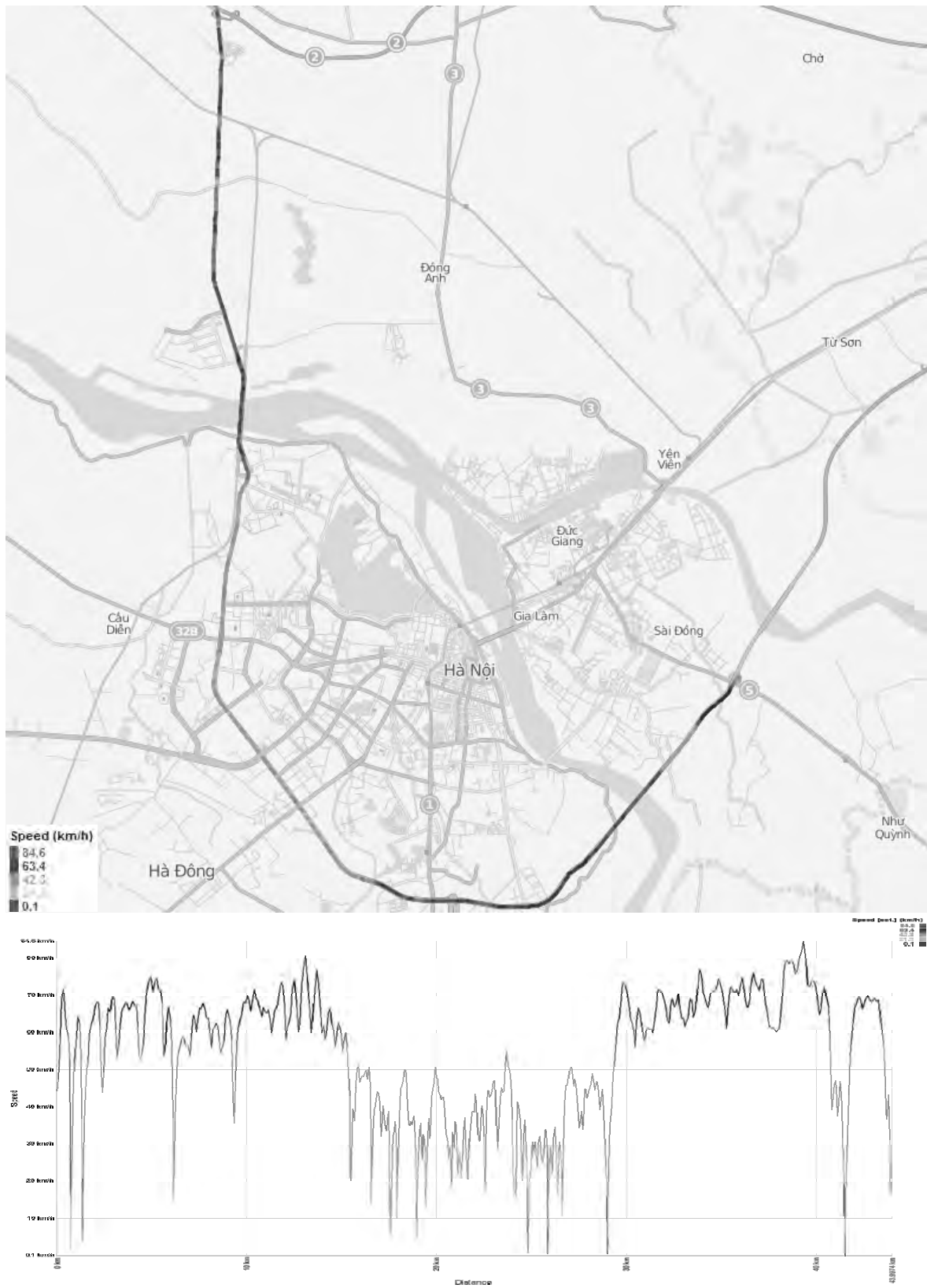


Figure 2.29 Afternoon Nov. 27, 2011



(b) Route 2

Figure 2.30 Morning Nov. 22, 2011

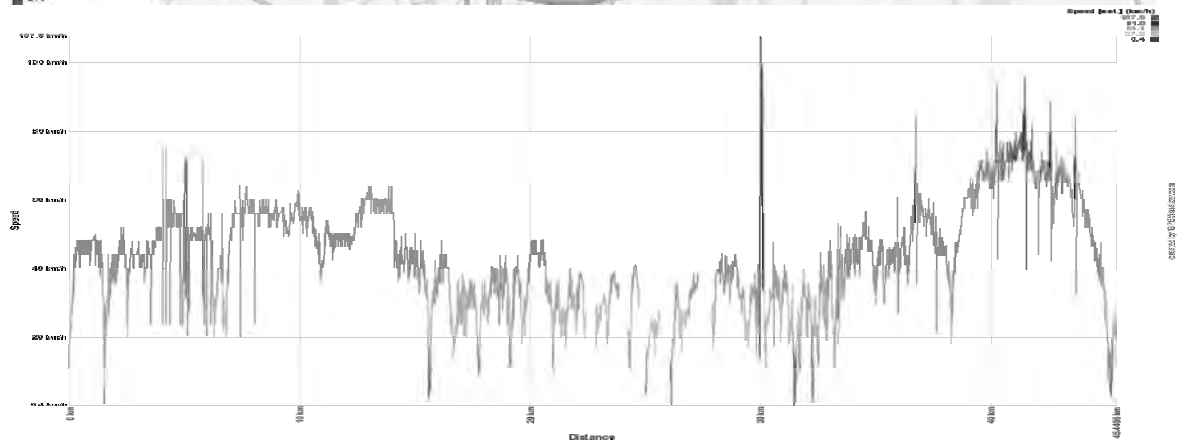


Figure 2.31 Afternoon Nov. 22, 2011

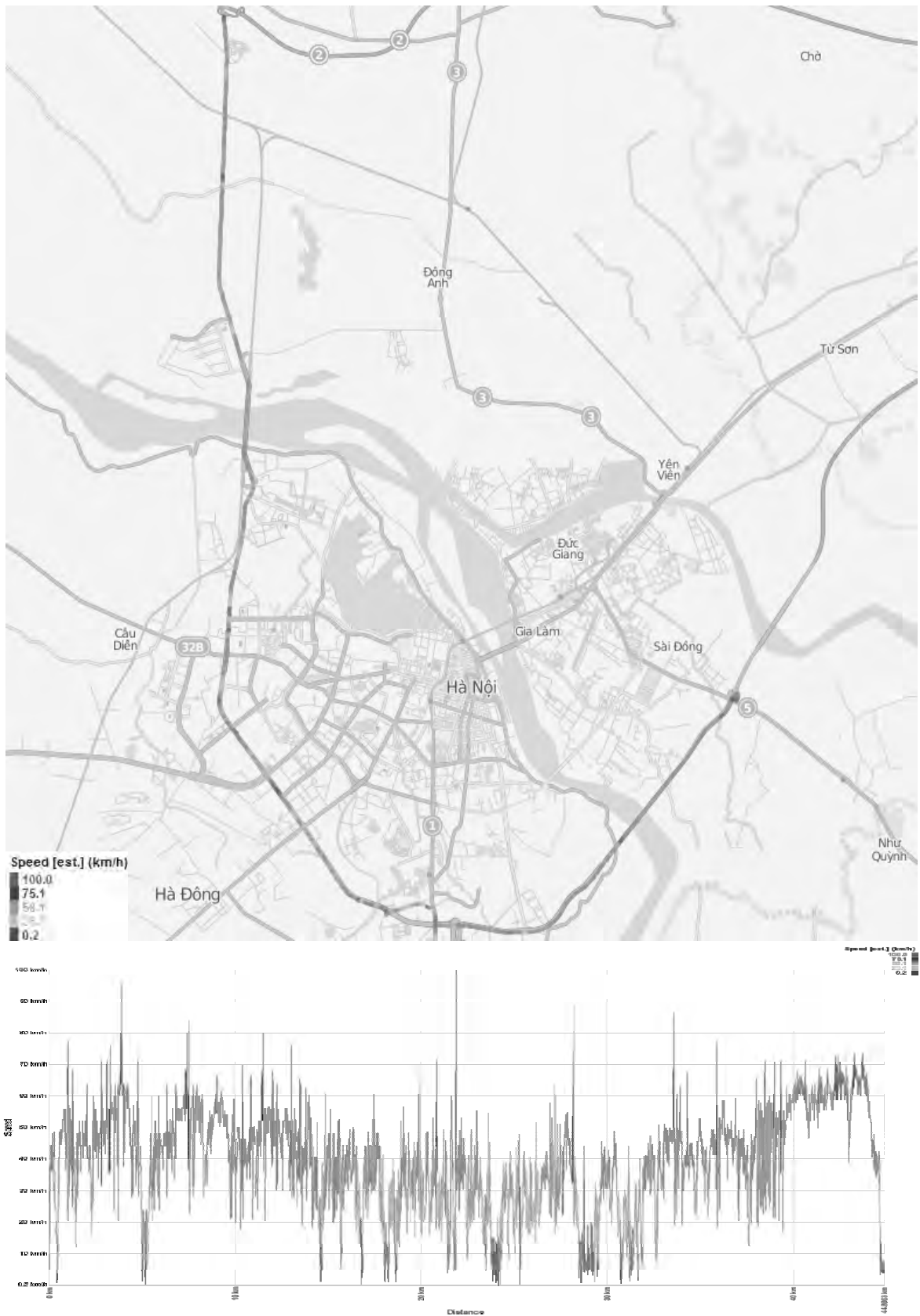
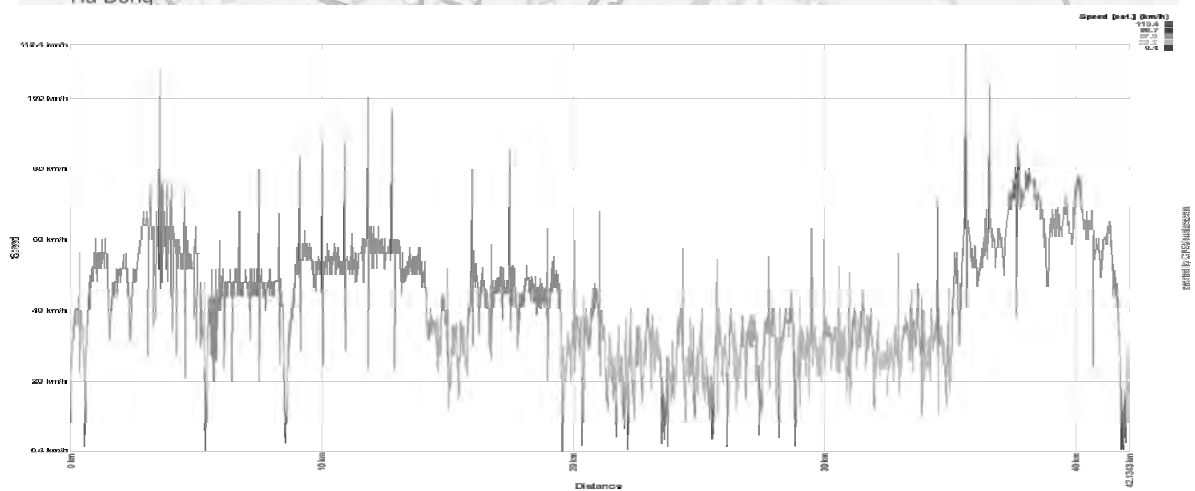


Figure 2.32 Morning Nov. 23, 2011



**Figure 2.33 Afternoon Nov. 23, 2011**

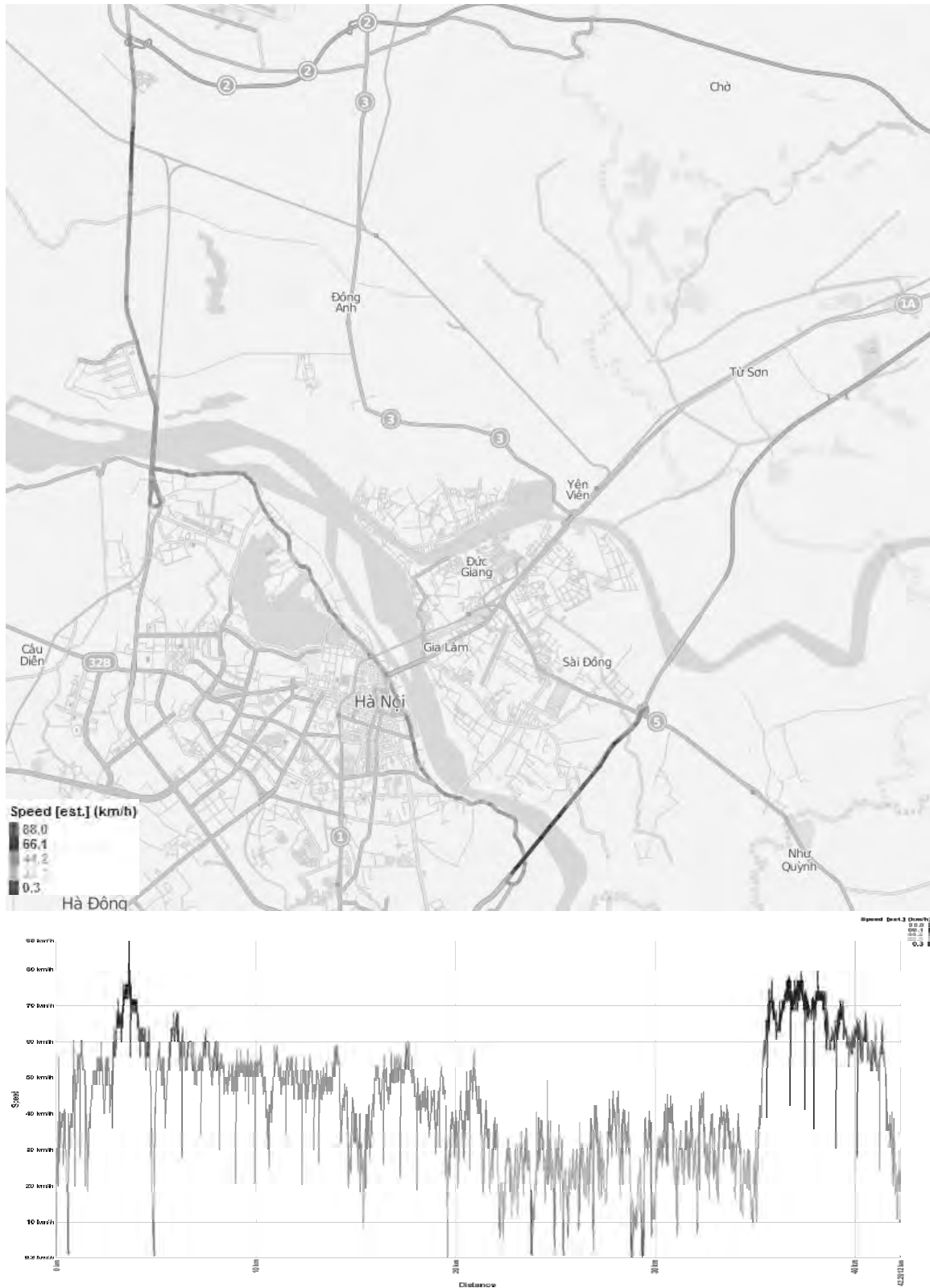
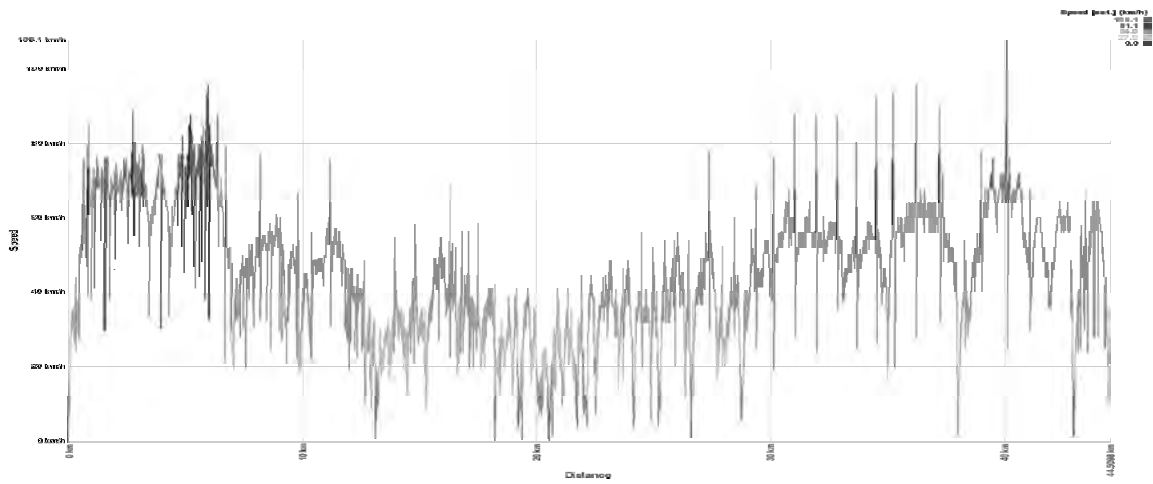
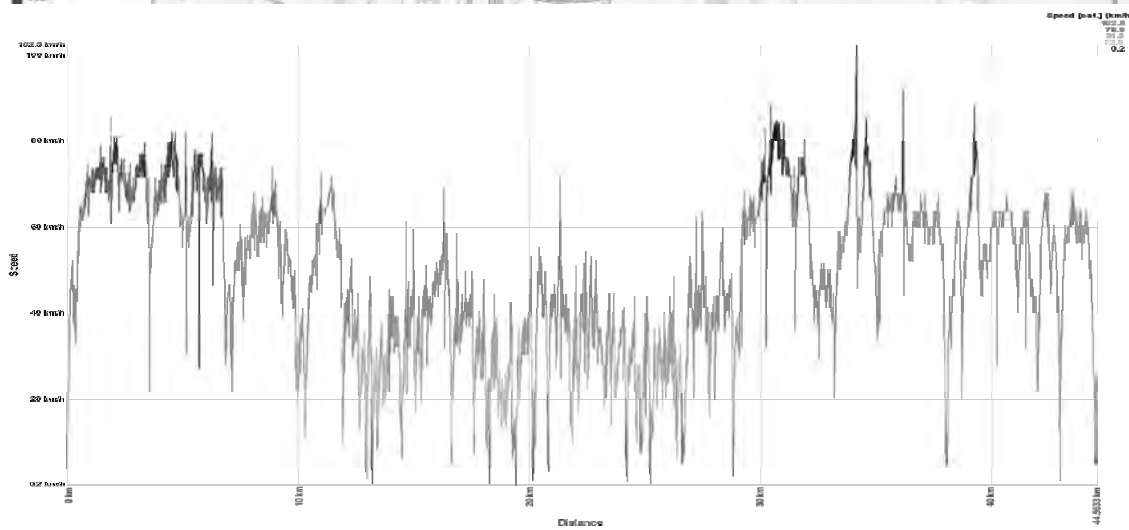




Figure 2.34 Morning Nov. 24, 2011



**Figure 2.35 Afternoon Nov. 24, 2011**



**Figure 2.36 Morning Nov. 27, 2011**

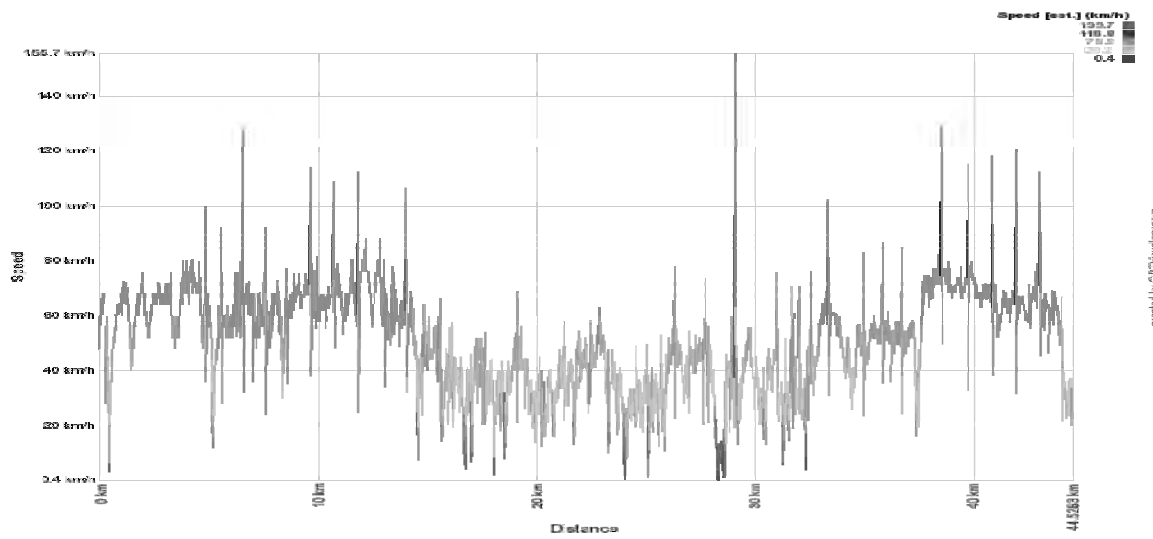
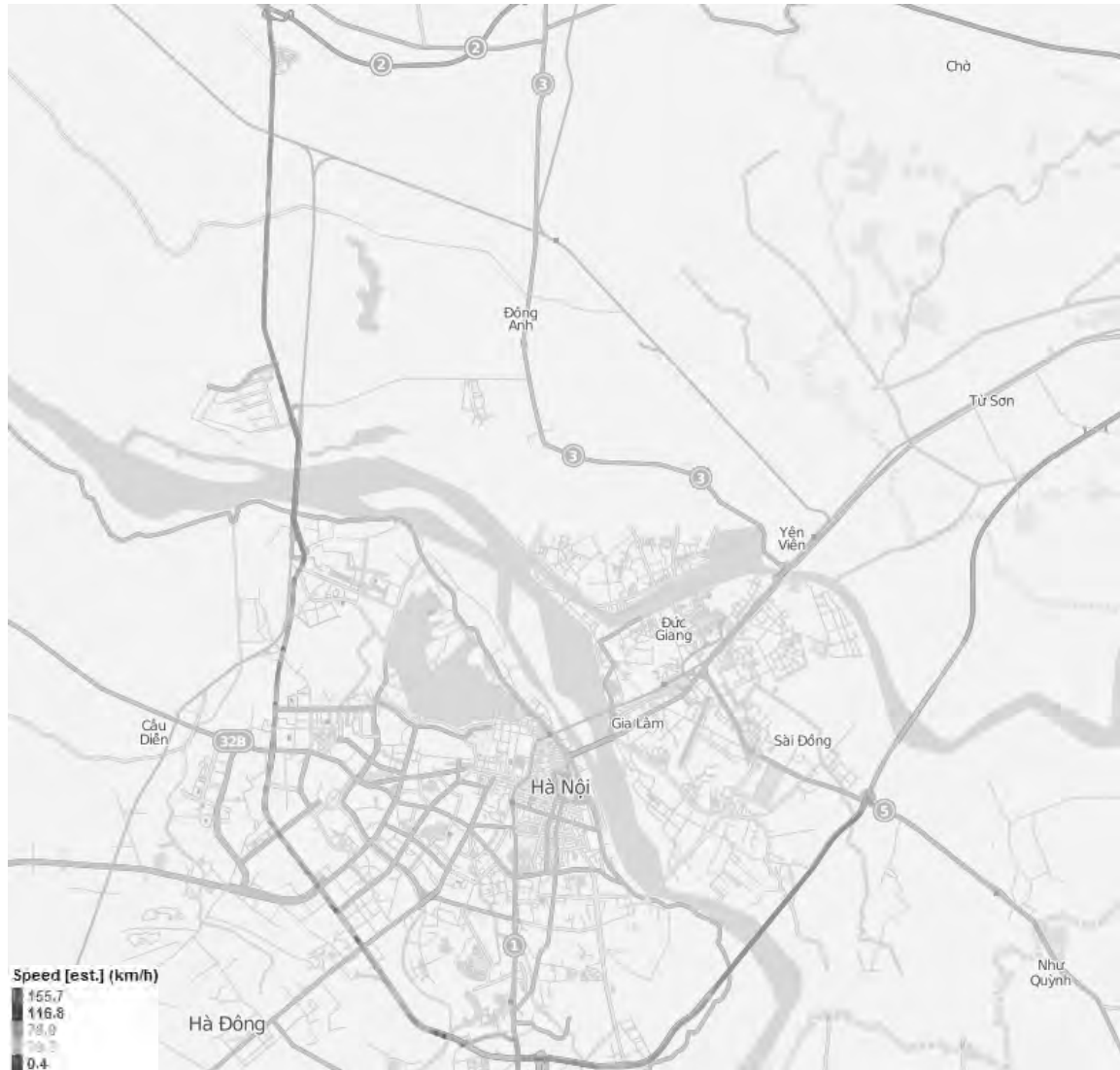
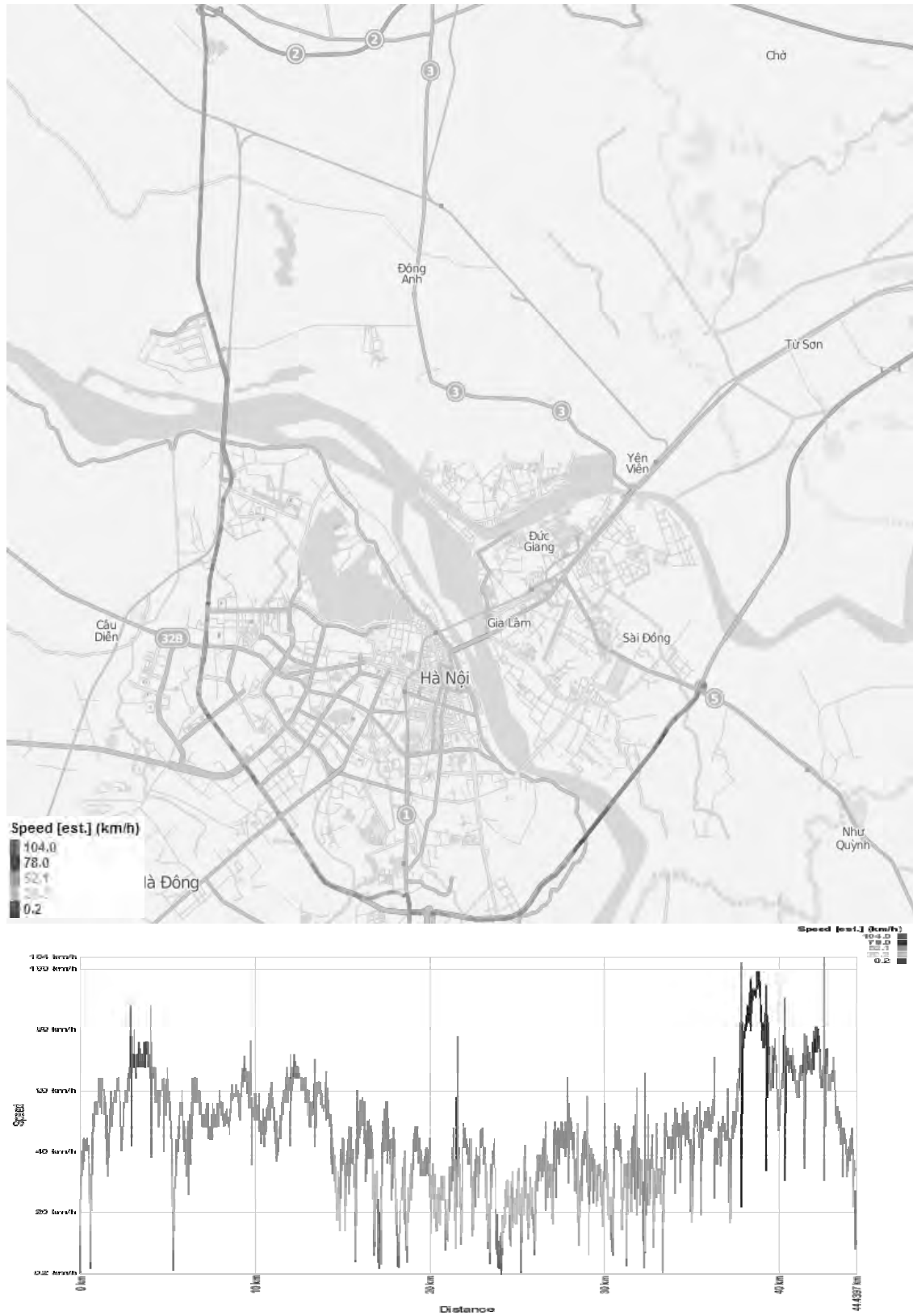


Figure 2.37 Afternoon Nov. 27, 2011



(c) Route 3

Figure 2.38 Morning Nov. 22, 2011

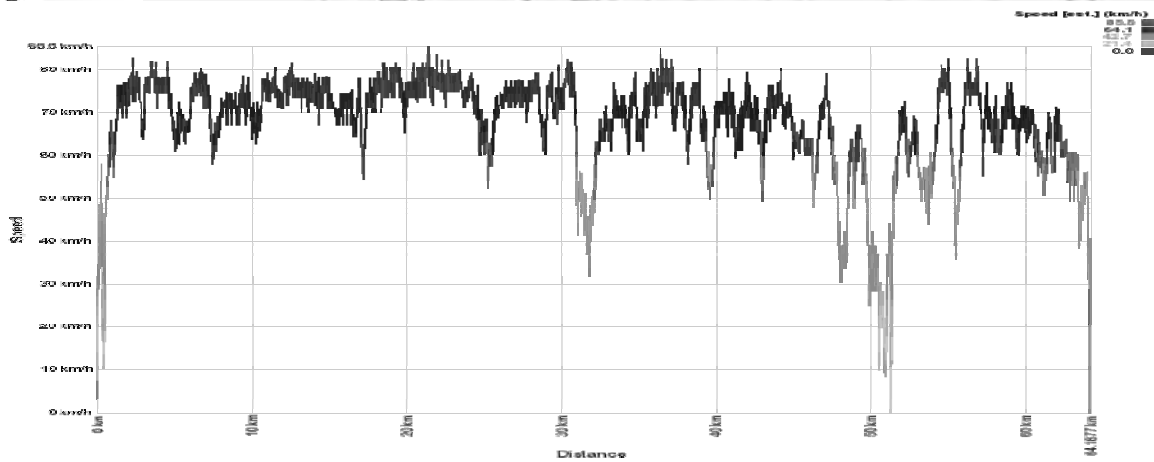
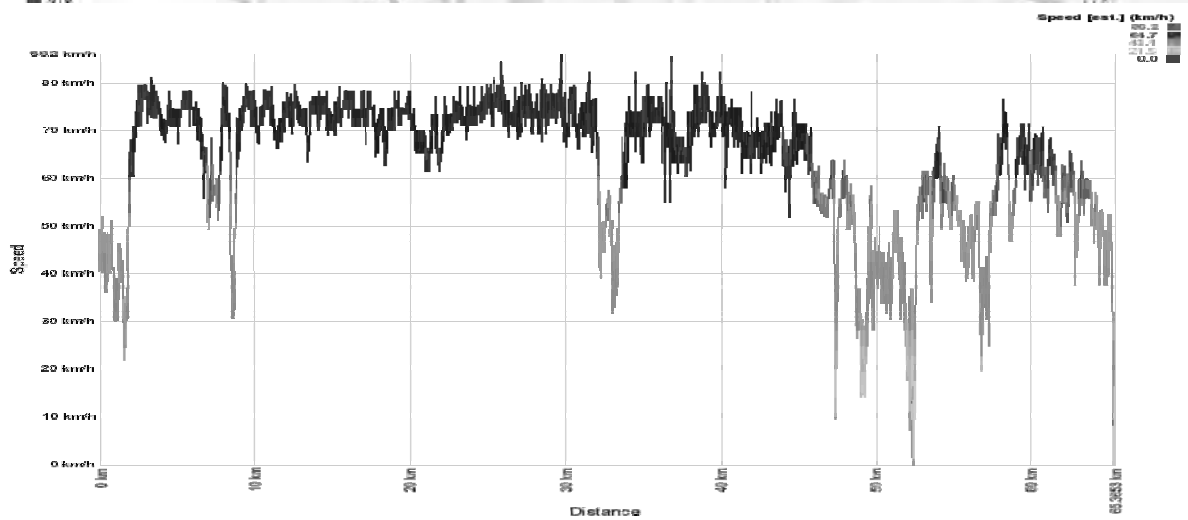
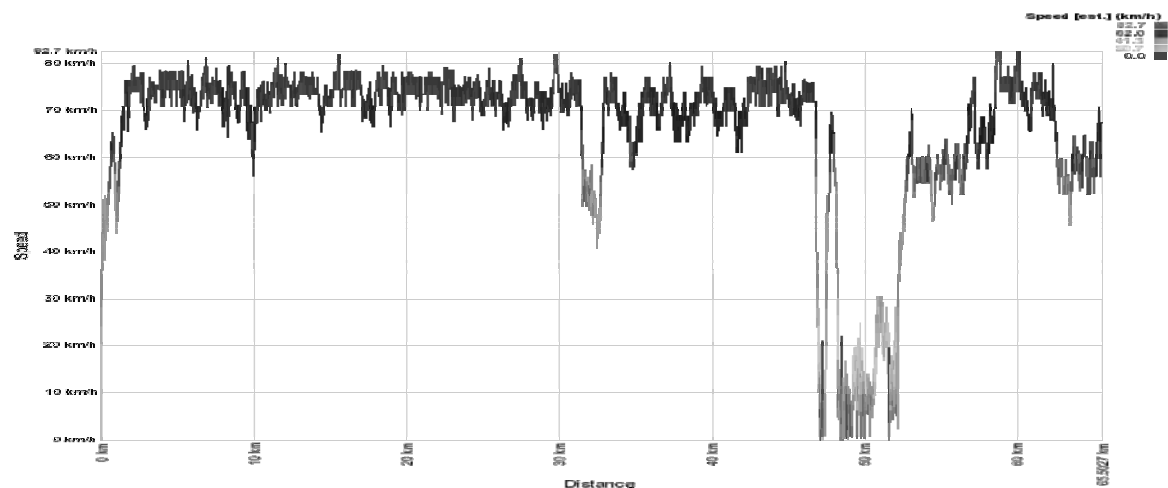


Figure 2.39 Afternoon Nov. 22, 2011



**Figure 2.40 Morning Nov. 23, 2011**

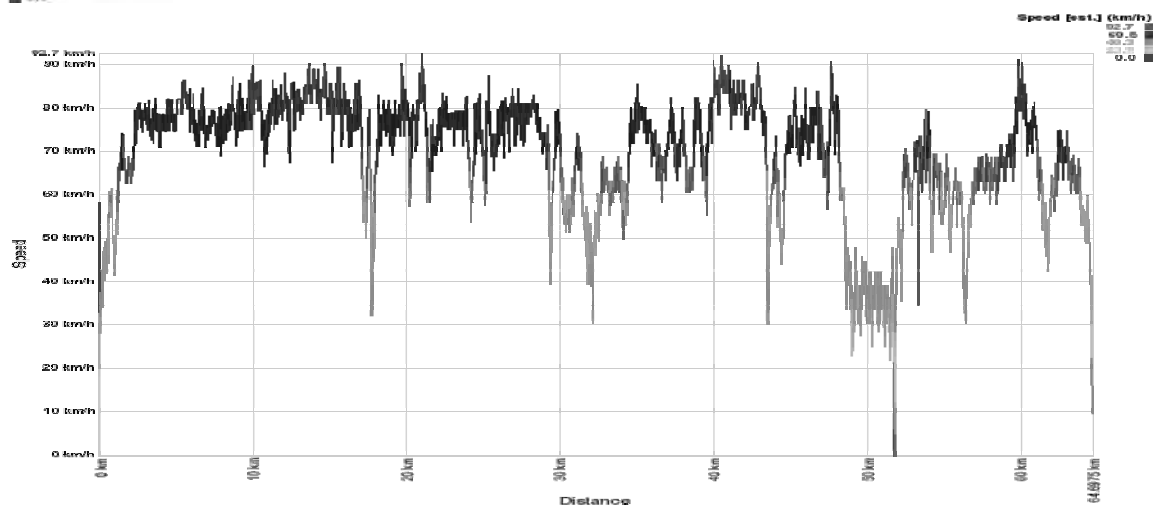
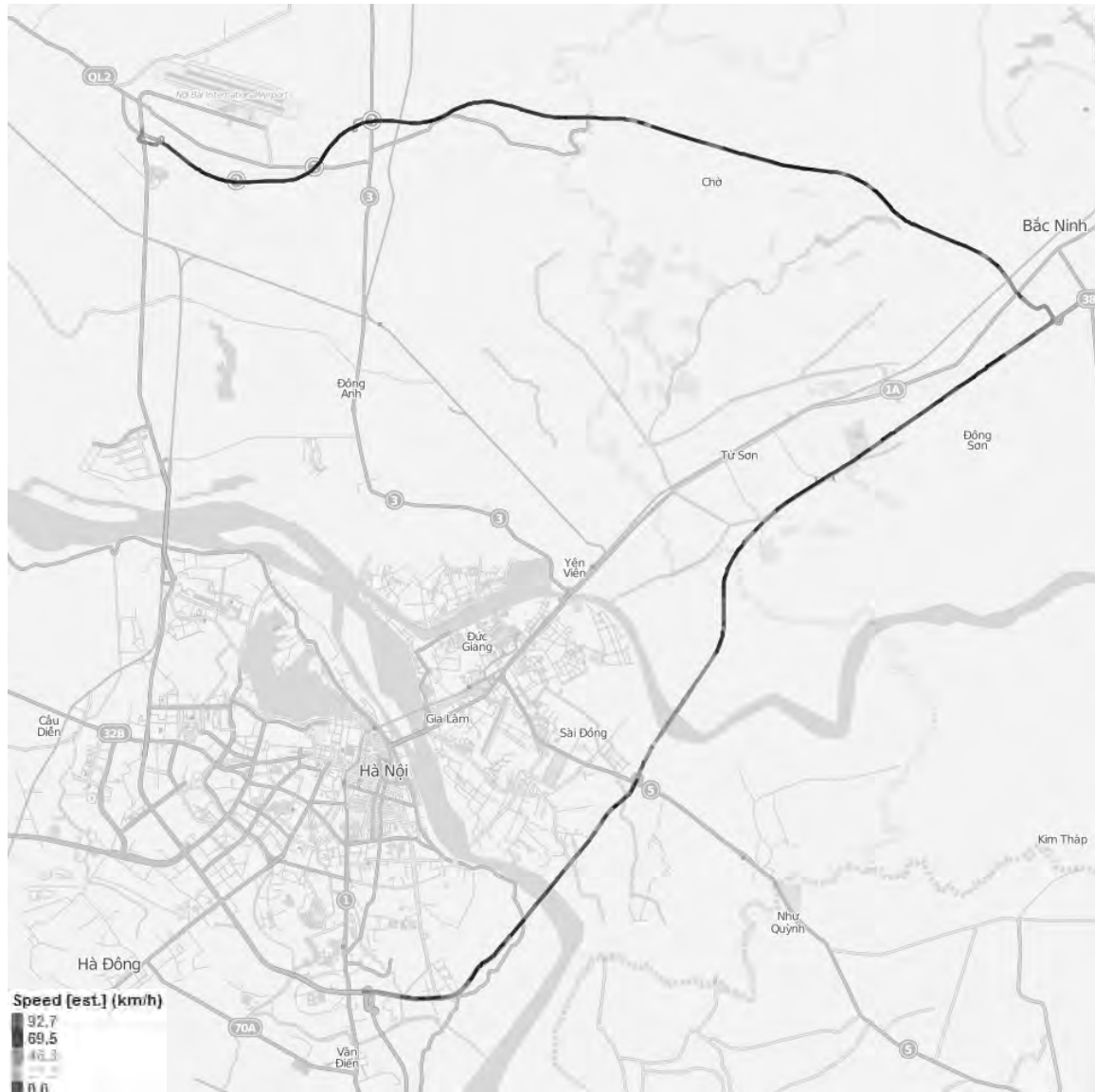


**Figure 2.41 Traffic Accident**

A serious traffic accident happened near Phu Dong Bridge on the route of Vehicle 3: on C to D1 section at 48.8km distance from O.

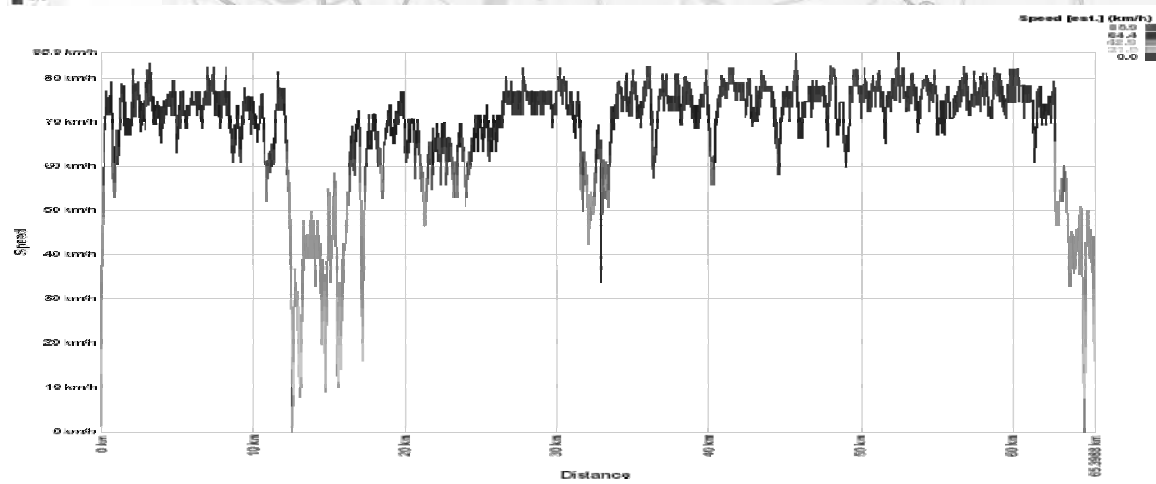


Figure 2.42 Afternoon Nov. 23, 2011



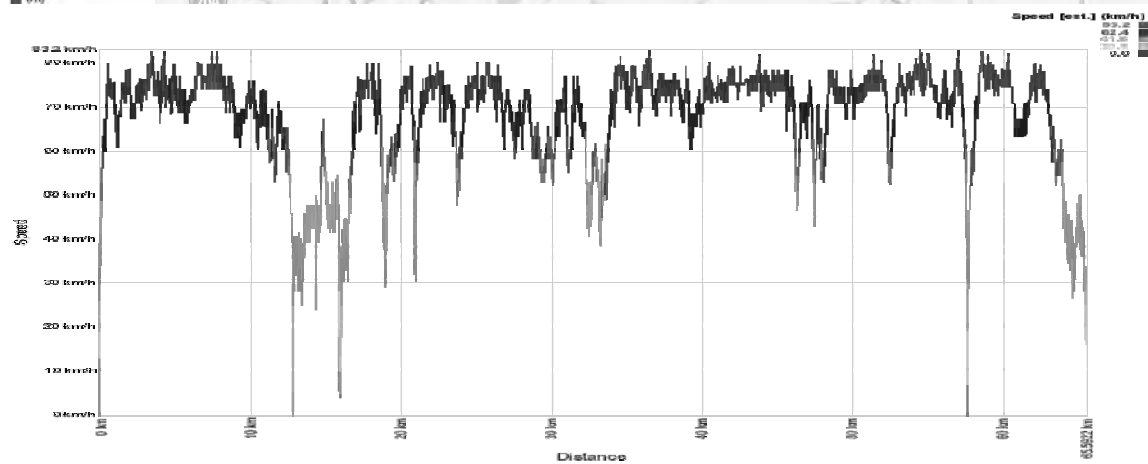


**Figure 2.43 Morning Nov. 24, 2011**



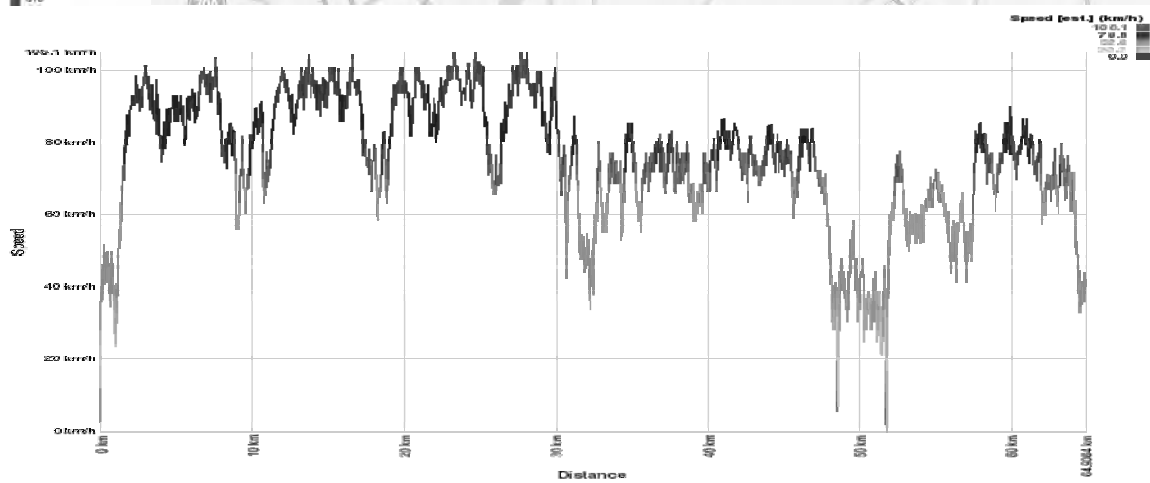
created by: GPSTrace.com

**Figure 2.44 Afternoon Nov. 24, 2011**

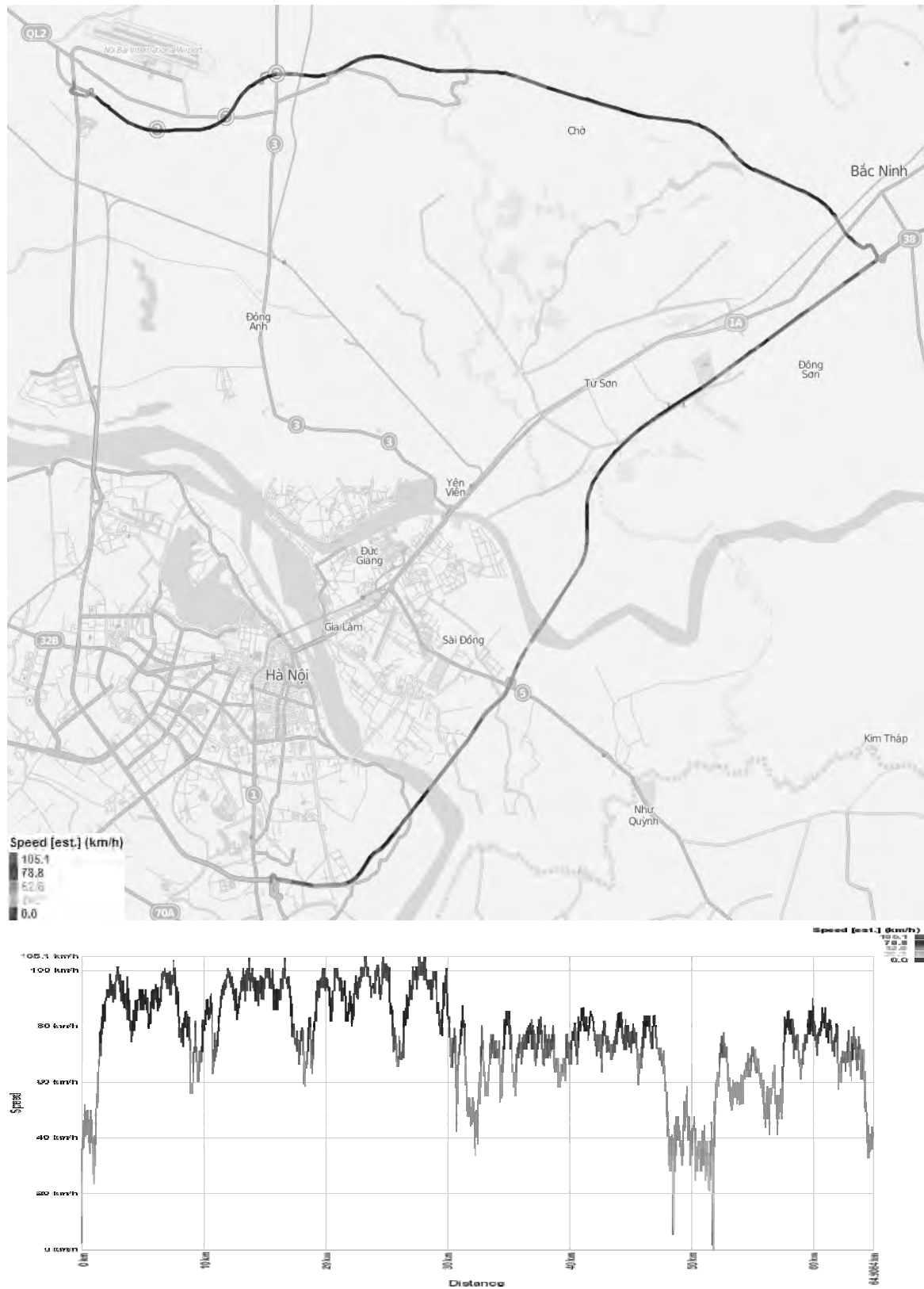


provided by GTS/STAN/ISS/2011

**Figure 2.45 Morning Nov. 27, 2011**



**Figure 2.46 Afternoon Nov. 27, 2011**



(d) Speed

Figure 2.47 Morning Nov. 23, 2011

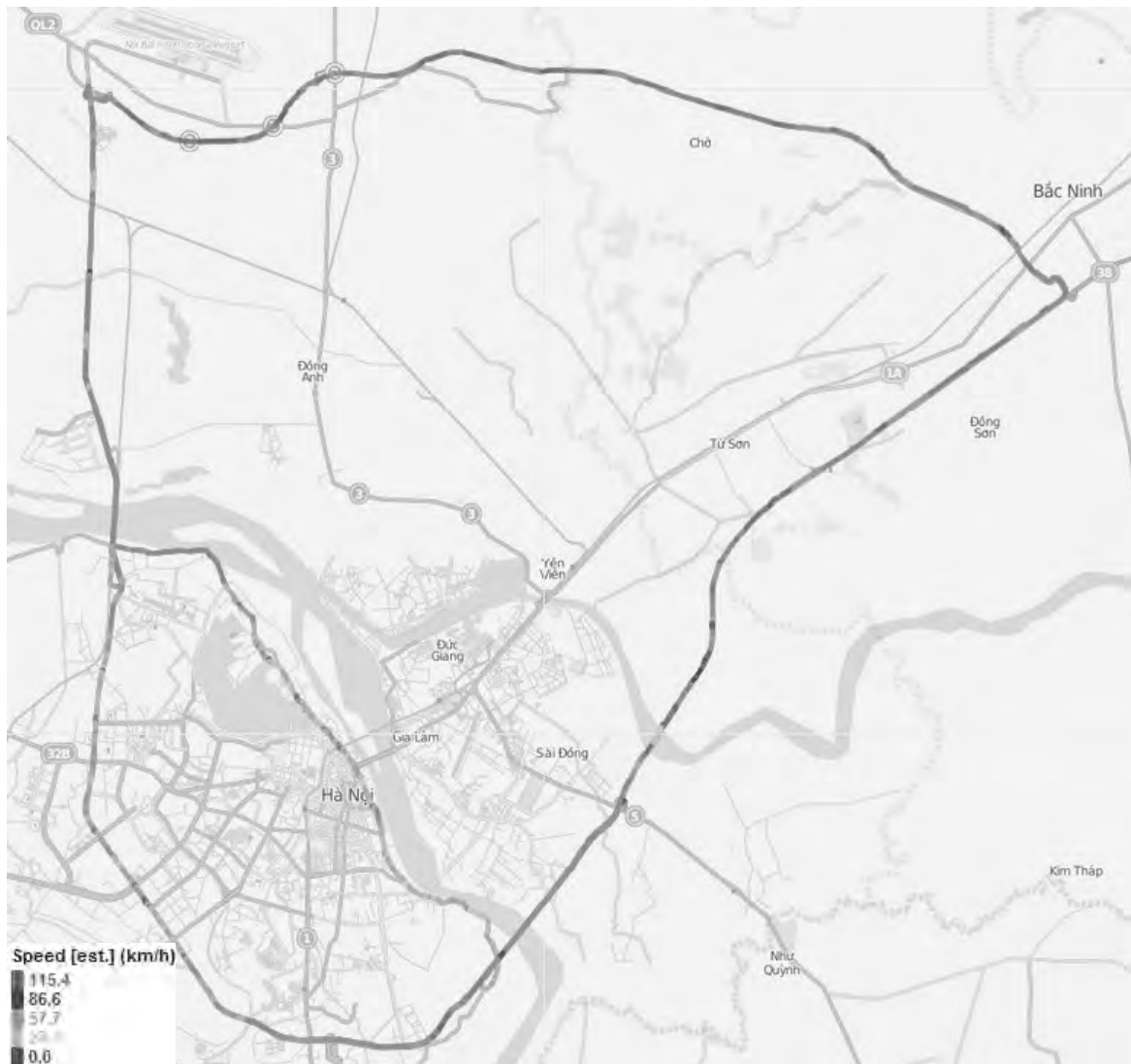
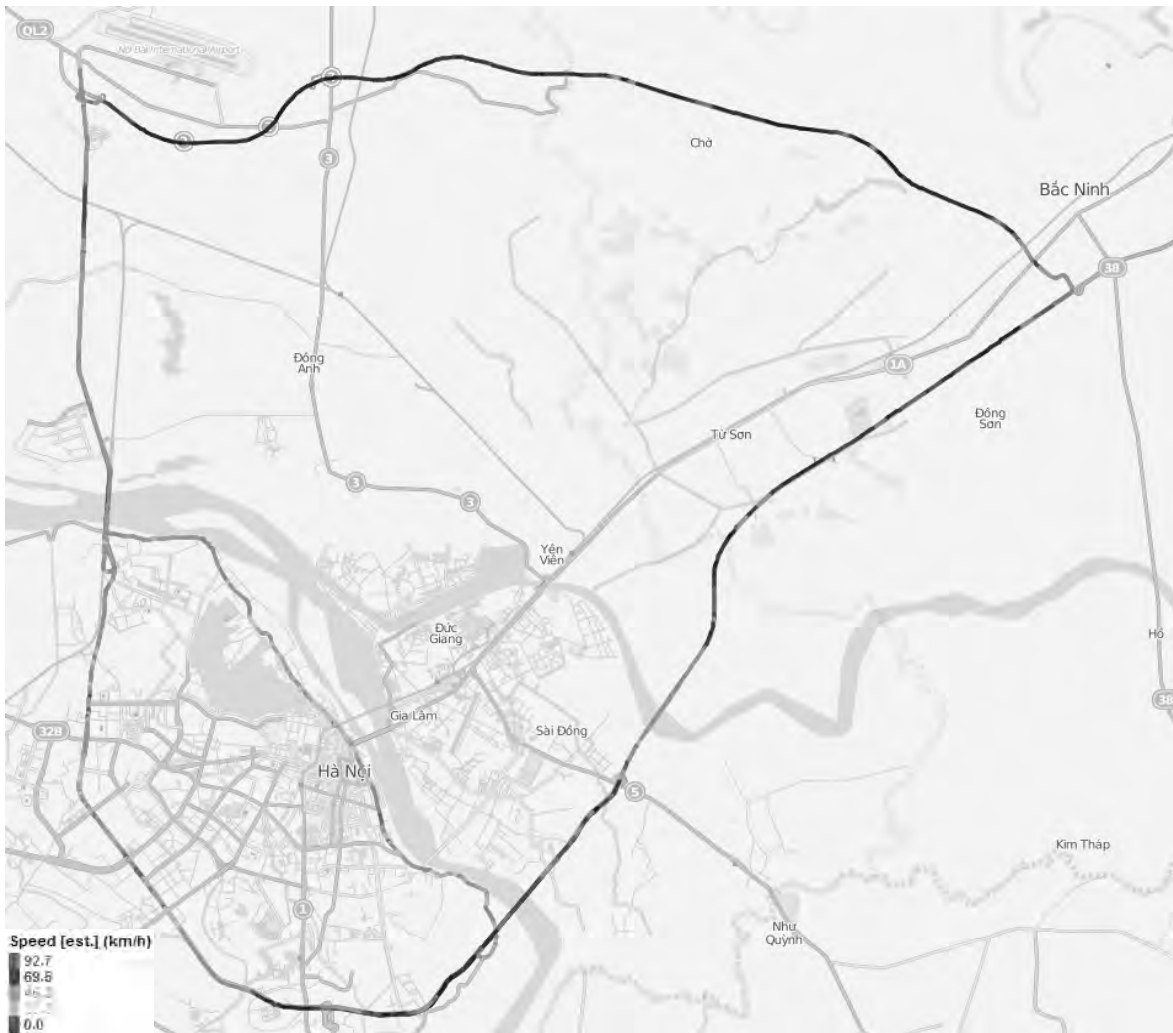


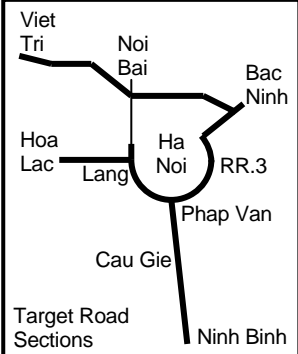
Figure 2.48 Afternoon Nov. 23, 2011



#### 4) Estimation of CO2 Emission and Fuel Consumption Reduction

##### (1) Base Case

**Figure 2.21 Road Sections in Base Case**



Target Road Sections of the Project (Base Case)	Length
Mai Dich–Thanh Tri (Ring Road 3)	27 km
Lang–Hoa Lac	28 km
Phap Van–Cau Gie	30 km
Cau Gie–Ninh Binh	50 km
Ha Noi–Bac Ninh	20 km
Noi Bai–Bac Ninh	33 km
Noi Bai–Viet Tri	80 km
<b>Total</b>	<b>268 km</b>

Source: ITS Integration Project (SAPI) Study

**Table 2.22 Estimation of CO2 Emission Reduction between “Without ETC” and “With ETC” (ton CO2 per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)		CO Emission (ton-CO2 per 1,000 km)			
				Without ETC	With ETC	Reduction	
Base Case	2015	PC	9,900	1,324	1,319		
		Bus	6,500	3,565	3,556		
		Truck	7,600	5,679	5,662		
		(Total)		10,568	10,537	31	0.3%
	2020	PC	16,000	2,140	2,131		
		Bus	9,800	5,374	5,361		
		Truck	10,900	8,145	8,121		
		(Total)		15,659	15,613	46	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of CO2 Emission Rate: Unit: g-CO2 per vehicle.km)

For passenger car:  $1864.3/v - 2.3201v + 0.0020070v^2 + 166.85$

For Bus:  $2784.6/v - 12.752v + 0.1590v^2 + 854.18$

For Truck:  $50.285/v - 27.312v + 0.20875v^2 + 1592.7$

ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.

**Table 2.23 Estimation of Fuel Consumption Reduction between “Without ETC” and “With ETC” (Kg Liter per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)		Fuel Consumption (Kilo Liter per 1,000 km)			
				Without ETC	With ETC	Reduction	
Base Case	2015	PC	9,900	536	534		
		Bus	6,500	1,231	1,228		
		Truck	7,600	1,970	1,964		
		(Total)		3,736	3,725	11	0.3%
	2020	PC	16,000	866	862		
		Bus	9,800	1,856	1,851		
		Truck	10,900	2,825	2,816		
		(Total)		5,547	5,530	17	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of Fuel consumption rate: Unit = cc per vehicle.km)

For passenger car:  $802.8/v - 1.0v + 0.0084v^2 + 70.0$

For Bus:  $976.9/v - 4.5v + 0.037v^2 + 299.7$

For Truck:  $17.7/v - 9.6v + 0.073v^2 + 558.7$

ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.

**(2) Case 1**

**Figure 2.24 Road Sections of Comparison Case 1**



**Table 2.25 Estimation of CO2 Emission Reduction between “Without ETC” and “With ETC” (ton CO2 per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)		CO Emission (ton-CO2 per 1,000 km)			
				Without ETC	With ETC	Reduction	
Case 1	2015	PC	13,300	1,779	1,772		
		Bus	3,500	1,919	1,915		
		Truck	10,800	8,070	8,047		
		(Total)		11,768	11,733	36	0.3%
	2020	PC	17,600	2,354	2,344		
		Bus	4,400	2,413	2,407		
		Truck	13,100	9,789	9,760		
		(Total)		14,556	14,511	44	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of CO2 Emission Rate: Unit: g-CO2 per vehicle.km)

For passenger car:  $1864.3/v - 2.3201v + 0.0020070v^2 + 166.85$

For Bus:  $2784.6/v - 12.752v + 0.1590v^2 + 854.18$

For Truck:  $50.285/v - 27.312v + 0.20875v^2 + 1592.7$

ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.

**Table 2.26 Estimation of Fuel Consumption Reduction between “Without ETC” and “With ETC” (Kg Liter per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)		Fuel Consumption (Kilo Liter per 1,000 km)			
				Without ETC	With ETC	Reduction	
Case 1	2015		13,300	720	717		
			3,500	663	661		
			10,800	2,799	2,790		
				4,182	4,168	13	0.3%
	2020		17,600	953	949		
			4,400	833	831		
			13,100	3,395	3,385		
				5,181	5,164	16	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of Fuel consumption rate: Unit = cc per vehicle.km)

For passenger car:  $802.8/v - 1.0v + 0.0084v^2 + 70.0$

For Bus:  $976.9/v - 4.5v + 0.037v^2 + 299.7$

For Truck:  $17.7/v - 9.6v + 0.073v^2 + 558.7$

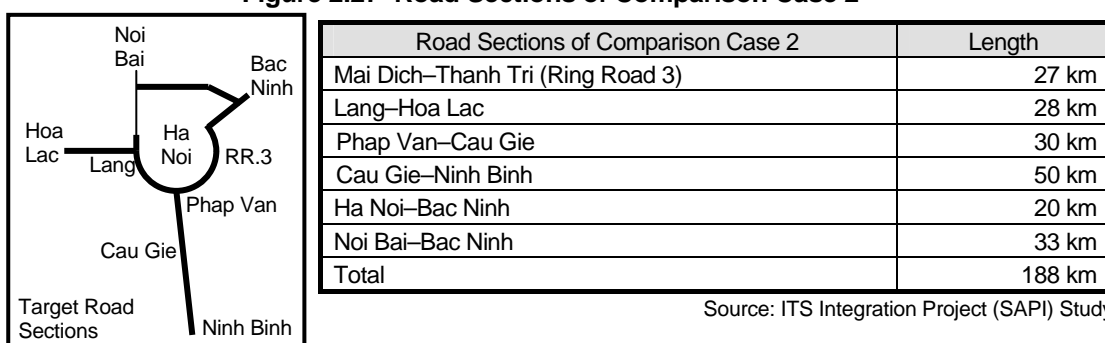
ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.



### (3) Comparison Case 2

**Figure 2.27 Road Sections of Comparison Case 2**



**Table 2.28 Estimation of CO2 Emission Reduction between “Without ETC” and “With ETC” (ton CO2 per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)	CO Emission (ton-CO2 per 1,000 km)				
			Without ETC	With ETC	Reduction		
Case 2	2015	PC	11,800	1,578	1,572		
		Bus	9,000	4,935	4,923		
		Truck	10,400	7,771	7,749		
		(Total)		14,285	14,243	41	0.3%
	2020	PC	18,400	2,461	2,451		
		Bus	13,700	7,513	7,494		
		Truck	14,500	10,835	10,803		
		(Total)		20,809	20,748	60	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of CO2 Emission Rate: Unit: g-CO2 per vehicle.km)

For passenger car:  $1864.3/v - 2.3201v + 0.0020070v^2 + 166.85$

For Bus:  $2784.6/v - 12.752v + 0.1590v^2 + 854.18$

For Truck:  $50.285/v - 27.312v + 0.20875v^2 + 1592.7$

ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.

**Table 2.29 Estimation of Fuel Consumption Reduction between “Without ETC” and “With ETC” (Kg Liter per 1,000 km / day)**

Case	Year	Traffic Volume (Vehicle per km/day)	Fuel Consumption (Kilo Liter per 1,000 km)				
			Without ETC	With ETC	Reduction		
Case 2	2015	PC	11,800	639	636		
		Bus	9,000	1,704	1,700		
		Truck	10,400	2,695	2,687		
		(Total)		5,038	5,023	15	0.3%
	2020	PC	18,400	996	992		
		Bus	13,700	2,594	2,588		
		Truck	14,500	3,758	3,746		
		(Total)		7,348	7,326	22	0.3%

Source: Estimated by ITS Integration Project (SAPI) Study Team

Note: i) The calculation formula is based on that of Institute of Japan Civil Engineering Associations:

(Formula of Fuel consumption rate: Unit = cc per vehicle.km)

For passenger car:  $802.8/v - 1.0v + 0.0084v^2 + 70.0$

For Bus:  $976.9/v - 4.5v + 0.037v^2 + 299.7$

For Truck:  $17.7/v - 9.6v + 0.073v^2 + 558.7$

ii) The traffic volumes used are number of vehicle per km in terms of estimated weighted average related to the objective expressway sections set for each calculation case.

iii) (%) in the column of reduction stands for the reduced rate compared to “Without ETC”.

## 5) Traffic Accident Data in Expressway in Japan

**Table 2.30 Traffic Accident in Expressway in Japan**

Year	Total Length of Expressway Operation (km)	Number of Accident (Injury/Fatality Accident)	Total Vehicle-km (10 <sup>9</sup> Vehicle-km)	Estimated Rate of Traffic Accident (per 10 <sup>9</sup> Vehicle-km)	Estimated Rate of Accident per Operation km
1963	71.1	94	0.15	626.67	1.32
1964	181.4	245	0.43	569.77	1.35
1965	189.7	301	0.54	557.41	1.59
1966	189.7	345	0.64	539.06	1.82
1967	207.8	386	0.90	428.89	1.86
1968	595.7	743	1.94	382.99	1.25
1969	638.5	1,907	4.84	394.01	2.99
1970	649.3	2,671	6.37	419.31	4.11
1971	709.6	2,298	5.39	426.35	3.24
1972	867.7	2,319	8.45	274.44	2.67
1973	1,213.8	2,625	11.05	237.56	2.16
1974	1,518.8	2,212	11.79	187.62	1.46
1975	1,888.3	2,271	12.74	178.26	1.20
1976	2,021.5	2,515	14.69	171.20	1.24
1977	2,194.5	2,518	16.57	151.96	1.15
1978	2,428.2	2,611	19.24	135.71	1.08
1979	2,579.1	2,453	21.19	115.76	0.95
1980	2,859.8	2,152	22.04	97.64	0.75
1981	3,010.4	2,273	23.82	95.42	0.76
1982	3,232.4	2,159	24.69	87.44	0.67
1983	3,435.2	2,617	26.44	98.98	0.76
1984	3,554.8	2,816	28.34	99.36	0.79
1985	3,720.9	2,802	30.86	90.80	0.75
1986	3,909.8	3,118	32.64	95.53	0.80
1987	4,279.6	3,402	35.59	95.59	0.79
1988	4,406.1	4,084	40.60	100.59	0.93
1989	4,660.5	5,274	44.80	117.72	1.13
1990	4,869.4	5,541	48.87	113.38	1.14
1991	5,054.9	6,016	52.10	115.47	1.19
1992	5,404.4	5,659	54.79	103.29	1.05
1993	5,574.3	6,259	57.22	109.38	1.12
1994	5,677.1	6,563	61.30	107.06	1.16
1995	5,929.6	6,803	63.35	107.39	1.15
1996	6,114.3	6,660	66.15	100.68	1.09
1997	6,394.9	6,574	67.79	96.98	1.03
1998	6,452.3	6,499	66.97	97.04	1.01
1999	6,615.2	6,900	67.43	102.33	1.04
2000	6,820.8	7,661	69.18	110.74	1.12
2001	6,958.6	7,701	69.17	111.33	1.11
2002	7,197.2	7,480	68.66	108.94	1.04
2003	7,343.3	7,118	68.40	104.06	0.97
2004	7,363.4	6,840	69.01	99.12	0.93
2005	7,389.1	6,797	69.75	97.45	0.92
2006	7,421.6	6,780	71.25	95.16	0.91

Source: Highway Handbook (Japan)

**Table 2.31 Number of Emergencies Attended by Kind of Accident and by Time Taken for Ambulance to Arrive at Scene of Accident in Japan (Year 2005)**

Kind of Accident	Less Than 3 Minutes	3 - 5 Minutes	5 - 10 Minutes	10 - 20 Minutes	More Than 20 Minutes	Total	Average Time (Minutes)
Traffic Accident	44,274 (6.8%)	166,262 (25.4%)	349,616 (53.4%)	85,881 (13.1%)	8,588 (1.3%)	654,621 (100.0%)	6.5
Sudden Illness	157,651 (5.0%)	724,837 (22.9%)	1,841,798 (58.2%)	416,074 (13.1%)	26,686 (0.8%)	3,167,046 (100.0%)	6.6
General Injury	37,158 (5.4%)	159,360 (23.2%)	386,829 (56.4%)	94,113 (13.7%)	8,197 (1.2%)	685,657 (100.0%)	6.7
Others	67,687 (8.8%)	212,842 (27.6%)	396,194 (51.4%)	85,294 (11.1%)	8,595 (1.1%)	770,612 (100.0%)	6.2
<b>Total</b>	<b>306,770 (5.8%)</b>	<b>1,263,301 (23.9%)</b>	<b>2,974,437 (56.4%)</b>	<b>681,362 (12.9%)</b>	<b>52,066 (1.0%)</b>	<b>5,277,936 (100.0%)</b>	<b>6.5</b>

Source: Report on Activities of Rescue Operations / First-aid, Year 2006 Version, Fire and Disaster Management Agency (FDMA) of the Ministry of Internal Affairs and Communications

**Table 2.32 Number of Emergencies Attended by Kind of Accident and by Time Taken for Ambulance to Arrive at Scene of Accident in Japan (Year 2009)**

Kind of Accident	Less Than 3 Minutes	3 - 5 Minutes	5 - 10 Minutes	10 - 20 Minutes	More Than 20 Minutes	Total	Average Time (Minutes)
Traffic Accident	9,894 (1.8%)	61,718 (11.3%)	344,934 (63.1%)	118,627 (21.7%)	11,764 (2.2%)	546,937 (100.0%)	8.1
Sudden Illness	44,430 (1.4%)	302,591 (9.6%)	2,089,061 (66.5%)	674,042 (21.5%)	31,758 (1.0%)	3,141,882 (100.0%)	7.9
General Injury	11,081 (1.6%)	69,538 (9.9%)	458,649 (65.2%)	154,003 (21.9%)	9,934 (1.4%)	703,205 (100.0%)	8.0
Others	23,162 (3.2%)	117,576 (16.1%)	447,210 (61.2%)	130,801 (17.9%)	11,453 (1.6%)	730,202 (100.0%)	7.5
<b>Total</b>	<b>88,567 (1.7%)</b>	<b>551,423 (10.8%)</b>	<b>3,339,854 (65.2%)</b>	<b>1,077,473 (21.0%)</b>	<b>64,909 (1.3%)</b>	<b>5,122,226 (100.0%)</b>	<b>7.9</b>

Source: Report on Activities of Rescue Operations / First-aid, Year 2010 Version, Fire and Disaster Management Agency (FDMA) of the Ministry of Internal Affairs and Communications

## 2.3 ITS Implementation and Study Results

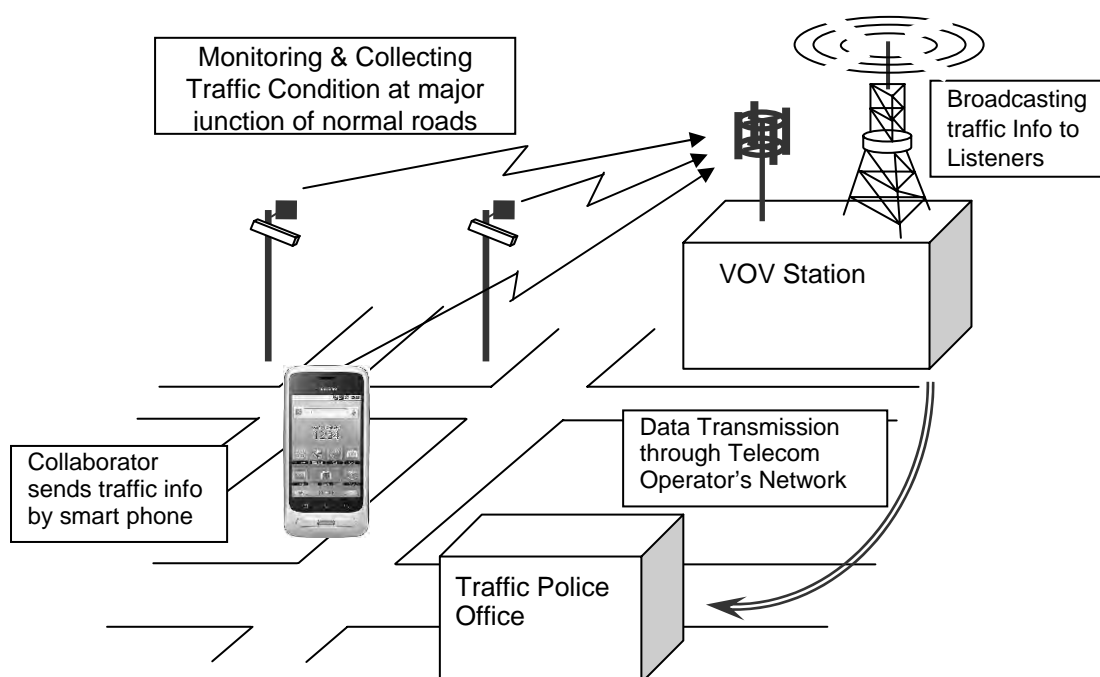
### 1) Traffic Information (by Voice of Vietnam)

The road/traffic monitoring of VOV is implemented in Hanoi and HCM city currently and it will be extended to whole NH1 route. Although the road/traffic information is collecting from CCTV camera, major information is provided by the people who are driving on the roads and by the VOV reporters and collaborators. The collecting information is mainly traffic jam, heavy traffic, and construction site.

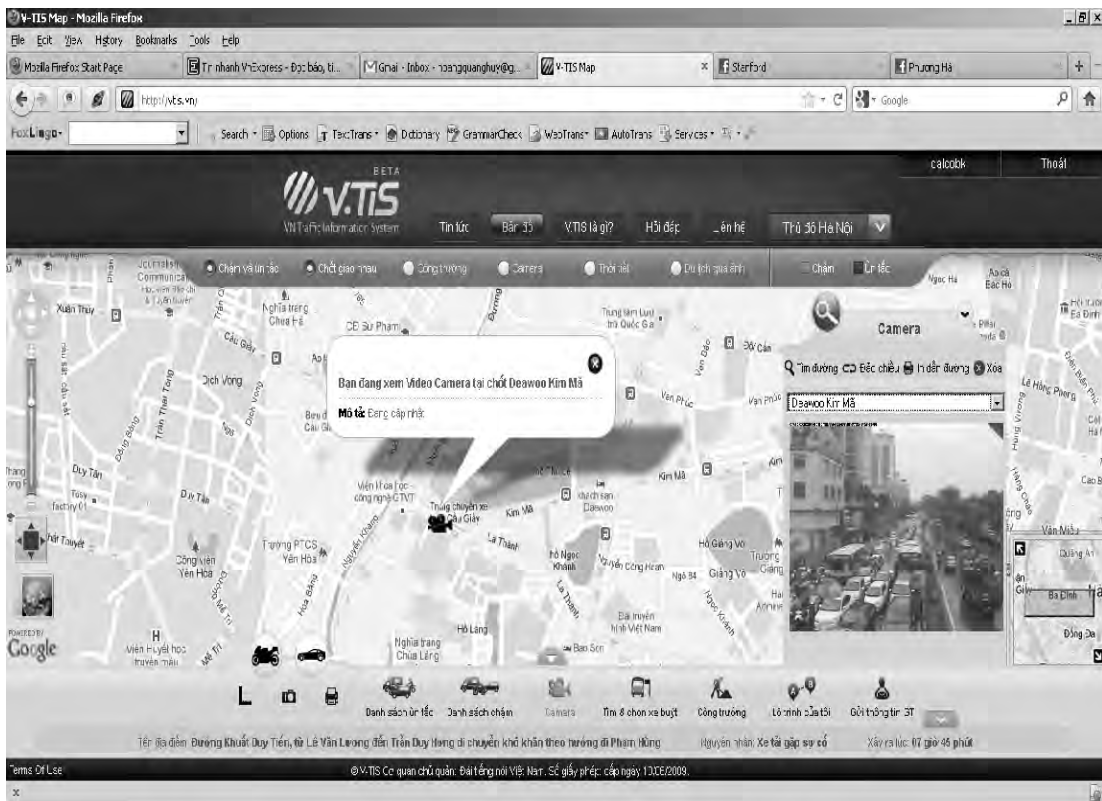
VOV installed 66 CCTV cameras in major intersections in urban area of Hanoi city, and the monitored moving image is transmitted to VOV center with wireless communication. The cameras are able to control from VOV center. The collected images are provided to traffic police also and utilized for its purpose.

On the other hand, the traffic police installed 20 CCTV cameras at major intersections within the area of Ring Road 3 in Hanoi and monitoring them. The Hanoi Traffic Police has a plan to install 60 CCTV cameras additionally in 2011. The monitored moving image is transmitted to traffic police center through optical fiber cable. In this system, the image processing technology is not applied, and only utilized for visual judgment. The monitored images are provided to VOV also.

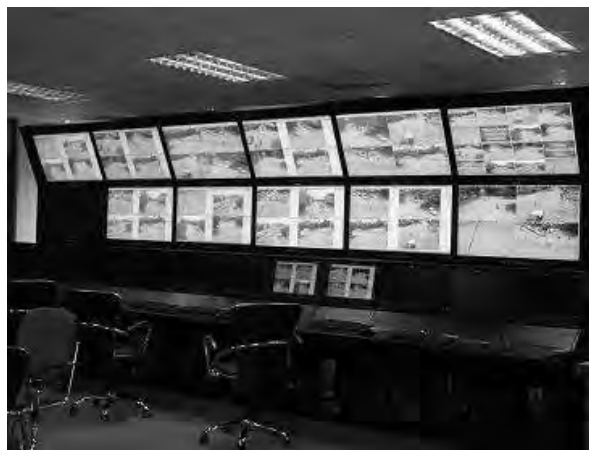
Figure 2.52 Structure of collection and dissemination of Traffic Information



**Figure 2.53 Traffic Information Web page maintain by Voice of Vietnam**



**Figure 2.54 Traffic Monitoring Centre (Voice of Vietnam)**



**2) VMS**

VMS is located on the road around Hanoi city. However, all of them are not intended to provide the road information such as traffic information. These are intended to provide the information of advertising and publicity. Therefore, was not implemented by the road operator.

According to interviews to DRVN, for the provision of advertising on the road that management does not allow DRVN in principle. However, it is the only road under the DRVN management, on the road under the Hanoi city admits.

**Figure 2.55 Existing condition of Duct and Cable**



**VMS at near Mai Dich intersection**



**VMS at near Giay**

### 3) Location Information Service based on GPS

In Vietnam, some bus and taxi company have already installed the GPS monitoring system for their driving location at their own operation centre. If actual traffic conditions is able to be acquired from these systems, more reliable and systematic traffic data will be provided in future.

**Figure 2.56 Location Information Service (VinaTrack)**



**Sample of GPS trucking application software**



**OBU for collection of location**

### 3) ETC

In Vietnam, the "infrared type" and "DSRC type" has been implemented for the ETC system. Near Hanoi city, the pilot project has been implemented DSRC system at Giay Tollgate on National Highway No.1 Such systems implemented by ViettinBank, all of the equipments implemented by using the BOT scheme.

According to interviews ViettinBank, 4 tollgates are already equipped. 15 tollgates supposed to be equipped at the end of this year, some contracts have been signed. Additionally, up to 20 tollgates next year, new contracts are coming. In the future, they target 80% of tollgates will be equipped in Vietnam. The DSRC system of Giay Tollgate is made by Kapsch which is using Passive DSRC method. It is the same system already in operation at Can Tho Bridge.

**Figure 2.57 Tollgate at Giay**



**Tollgate at Giay**



**Inside of Tollbooth**



**DSRC Antenna at Tollgate of Giay**



**CCTV Camera for enforcement**

#### **4) Study Results**

##### **(1) ITS Master Plan**

The following items in the ITS Master Plan are reviewed for the preparation of the Study.

- Goals of ITS
- ITS user services
- Road map of ITS implementation
- Implementation packages
- Operation Framework of ITS
- Framework of Road Operation using ITS

##### **(2) Draft ITS Standards**

The following documents of the Draft ITS Standards prepared were reviewed:

- Draft ITS Design Standards (volumes organized by three priority ITS user services)
- Draft ITS Message/Data Standards
- Draft ITS Communication System Plan
- Draft ITS General Specifications (volumes organized by the functional packages).

## 2.4 Communication Network and Power Supply

### 1) Cable/Duct Condition at Roadside

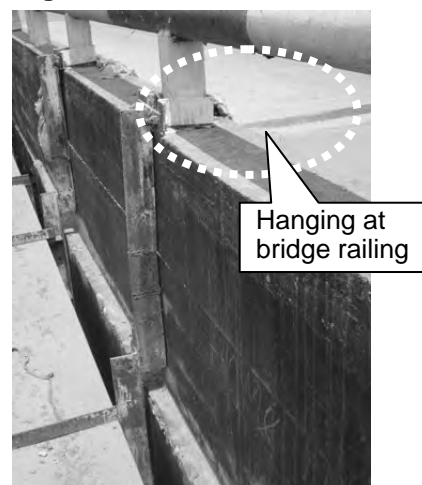
On the existing expressways, communication ducts have not been installed in many sections. The communication ducts are often installed by telecommunication companies; however, it appears that the communication ducts is not get proper and sufficient maintenance.

In the case of the sections on the existing bridges, it is frequently seen that communication ducts have been attached using brackets to the hand rails. The reason is necessity of non-destructive testing for attaching the ducts directly to the bridges avoiding damage on the reinforcement by anchors.

**Figure 2.58 Existing Condition on Ring Road 3**



**STA6+300 Van Tri Bridge**



**STA6+300 Van Tri Bridge**

**Figure 2.59 Existing Condition of Duct and Cable on Arterial Roads**



**Hand hall and Duct**



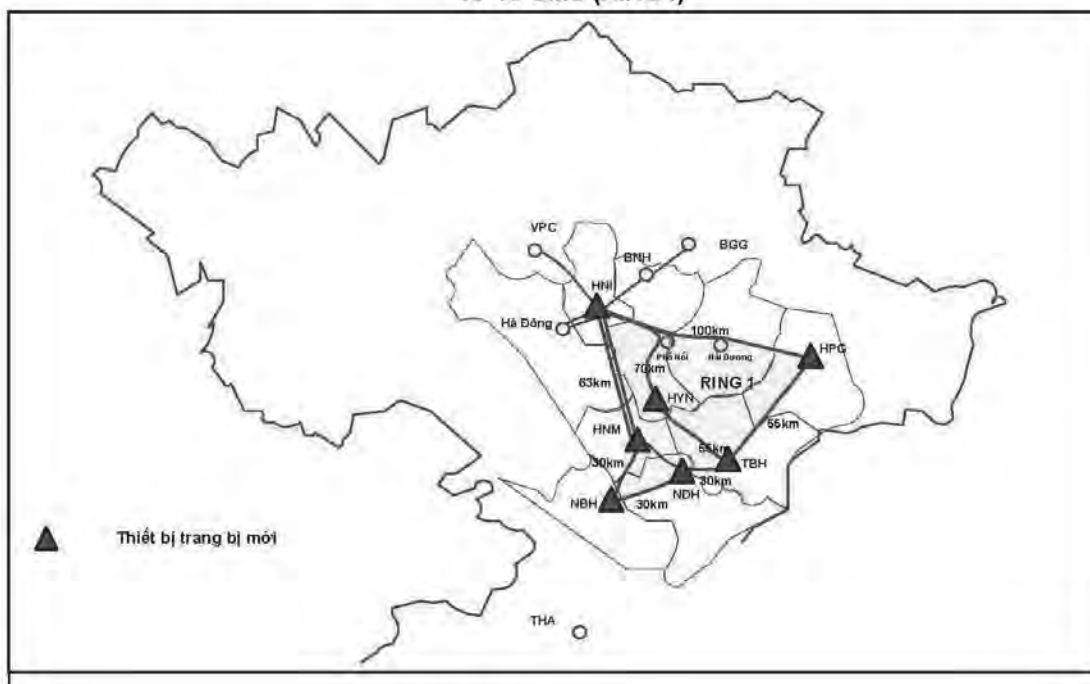
**Cable Installation (VNPT)**



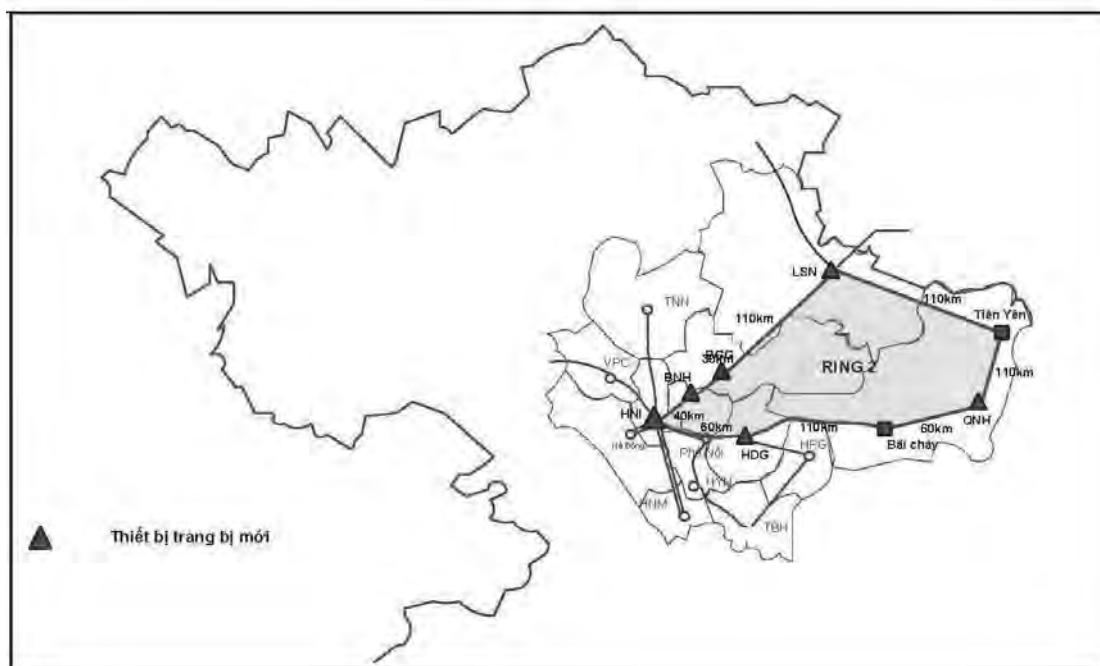
## 2) Backbone Network of Telecommunication by VNPT

The backbone networks of telecommunication by VNPT in the northern area of Vietnam are shown in the following figures.

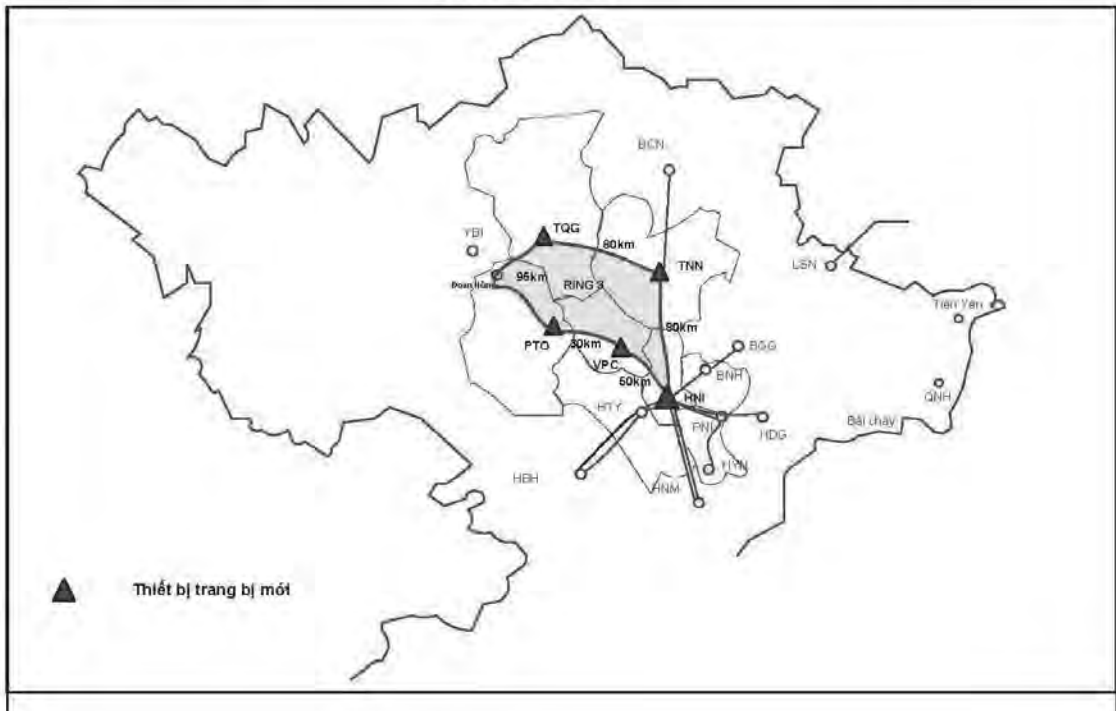
**Figure 2.60 HÀ NỘI - HÀ NAM- NINH BÌNH- NAM ĐỊNH - THÁI BÌNH - HẢI PHÒNG - HÀ NỘI**  
**16\*10 Gb/s (RING1)**



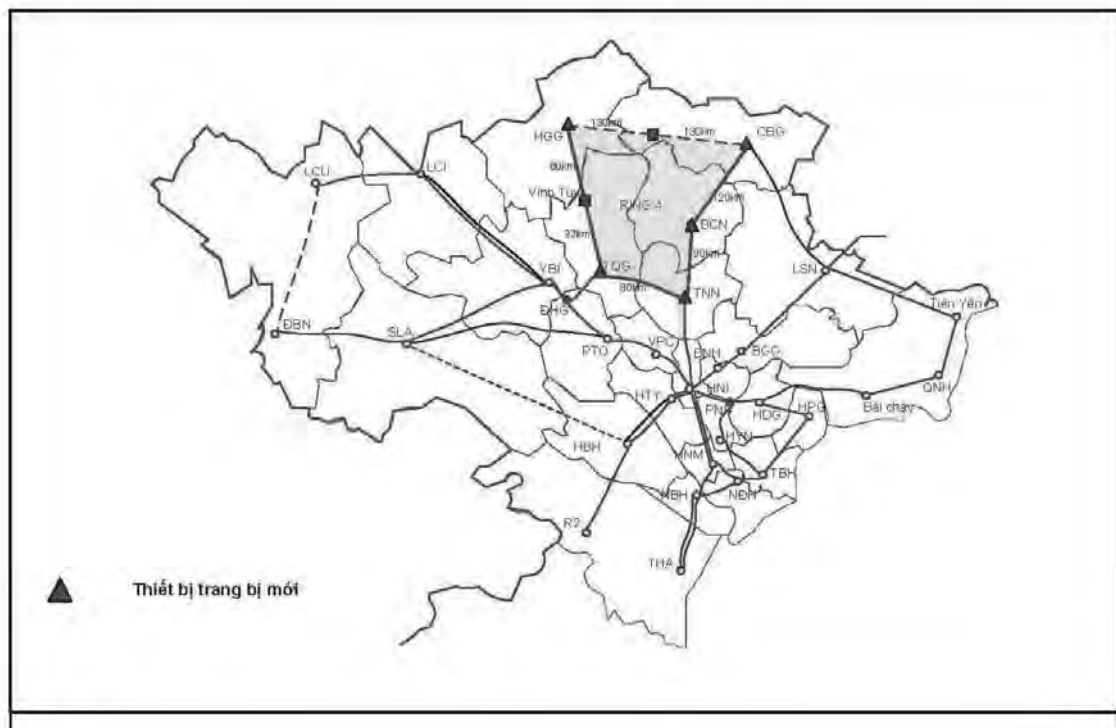
**Figure 2.61 HÀ NỘI - BẮC NINH- BẮC GIANG- LẠNG SƠN - QUẢNG NING - HẢI DƯƠNG- HÀ NỘI**  
**10\*10 Gb/s (RING2)**



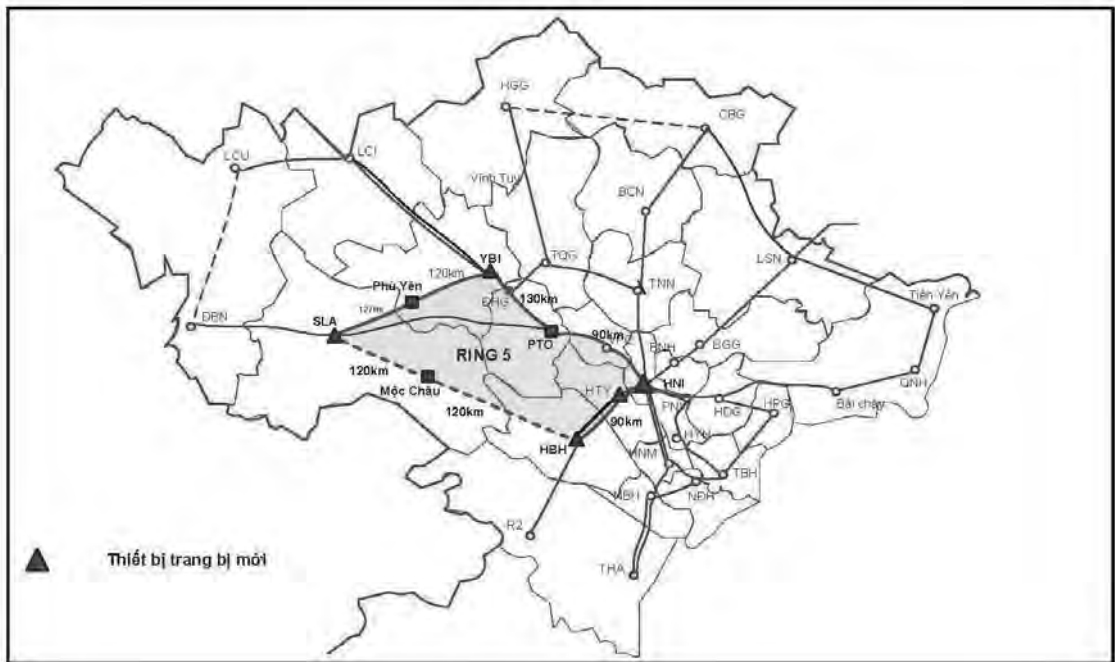
**Figure 2.62 HÀ NỘI - VINH PHÚC - PHÚ THỌ - TUYẾN QUANG- THÁI NGUYÊN - HÀ NỘI**  
**12\*10 Gb/s (RING3)**



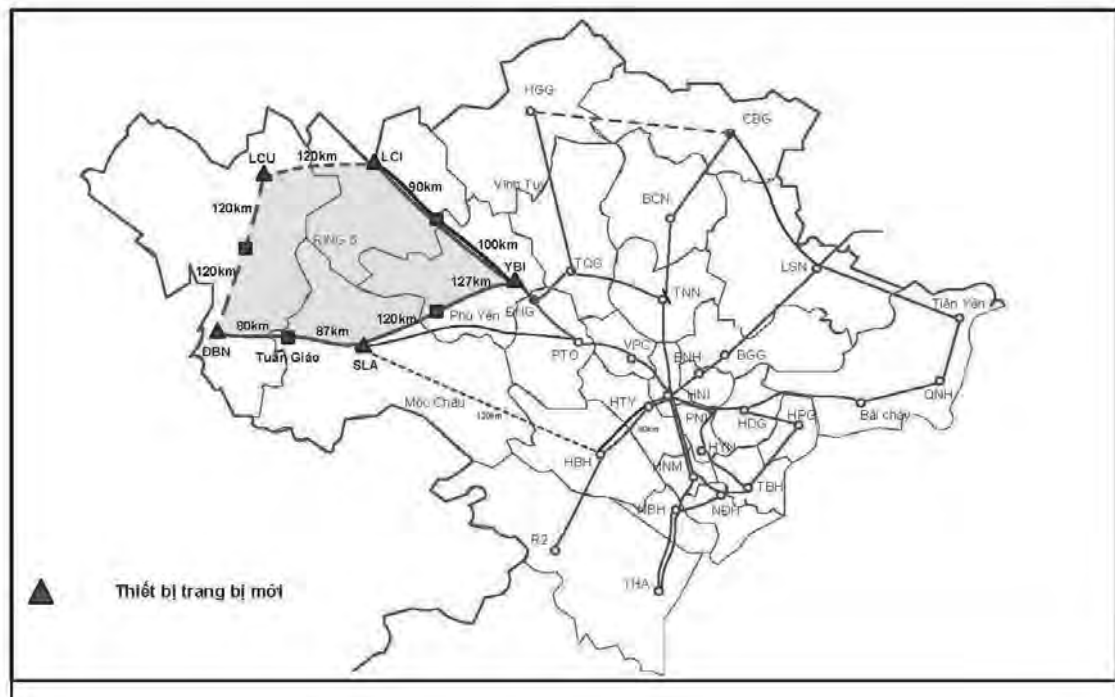
**Figure 2.63 THÁI NGUYÊN - TUYẾN QUANG - HÀ GIANG – CAO BĂNG - BẮC CẠN- THÁI NGUYÊN**  
**4\*10 Gb/s(RING4)**



**Figure 2.64 HÀ NỘI - HOÀ BÌNH - SƠN LA - YÊN BÀI - PHÚ THỌ - HÀ NỘI**  
**8\*10 Gb/s (RING 5)**



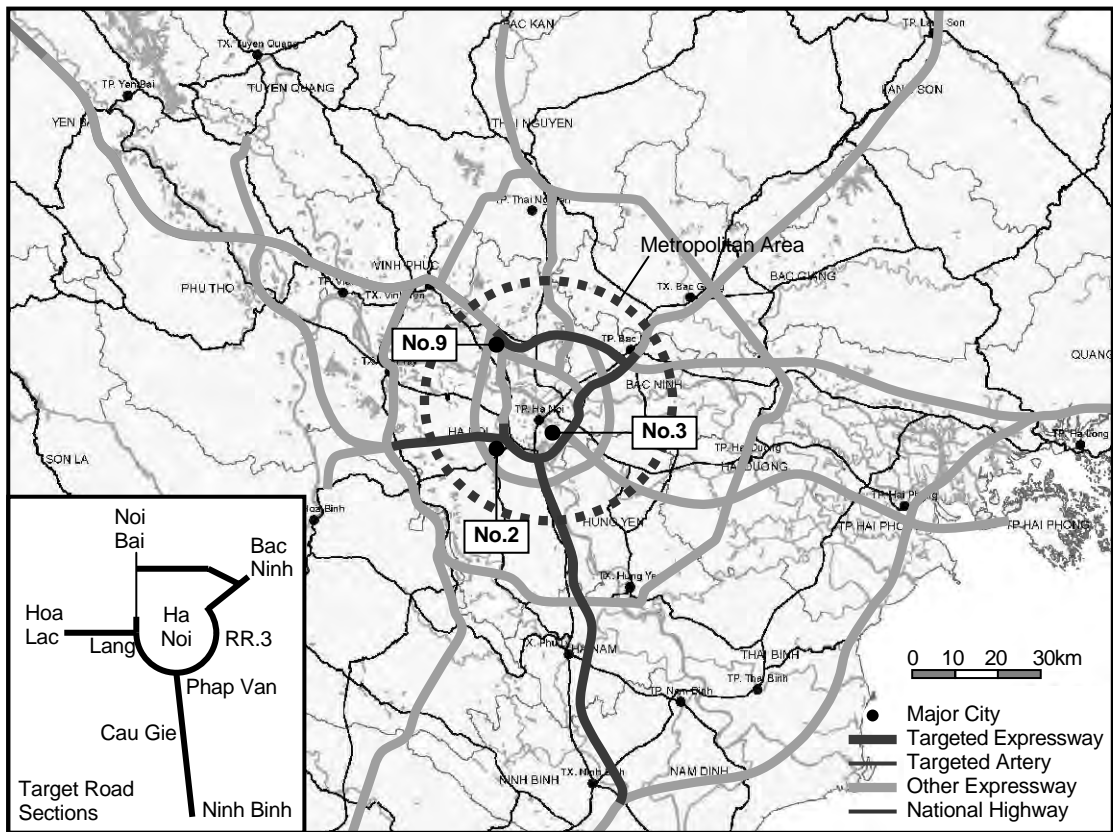
**Figure 2.65 YÊN BÀI - SƠN LA - ĐIỆN BIÊN – LAI CHÂU- LÀO CAI - YÊN BÀI**  
**2\*10 Gb/s (RING6)**



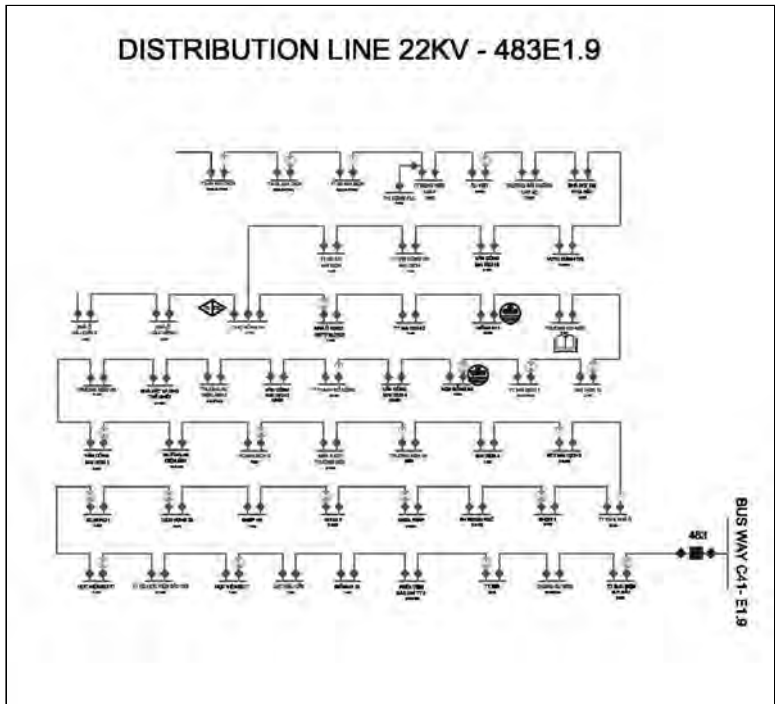
### 3) Network of Electric Power Supply

Candidate electric power supply substations for the Regional Main Center are located as shown in the map below.

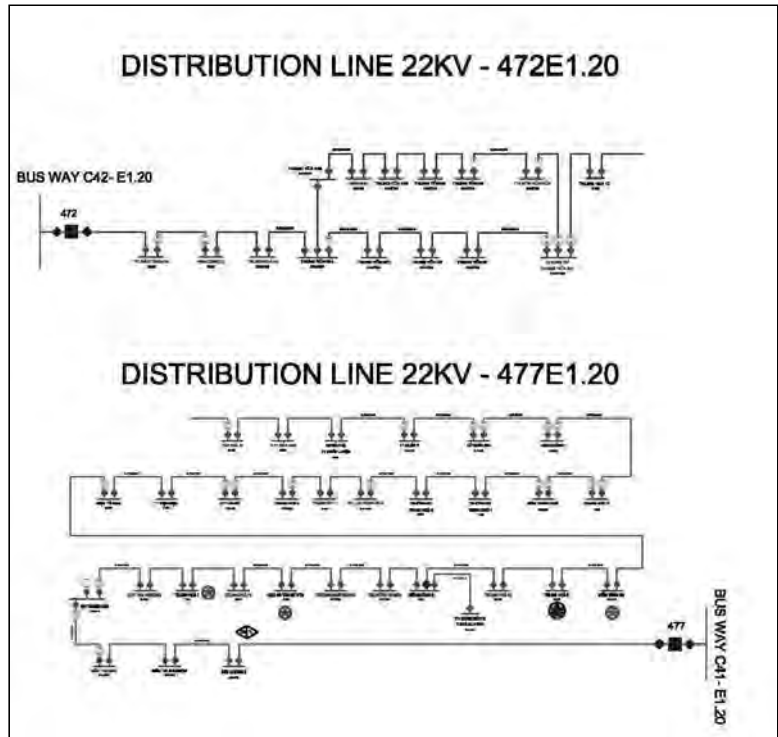
**Figure 2.66 Location of Candidate electric Power Supply Substations**



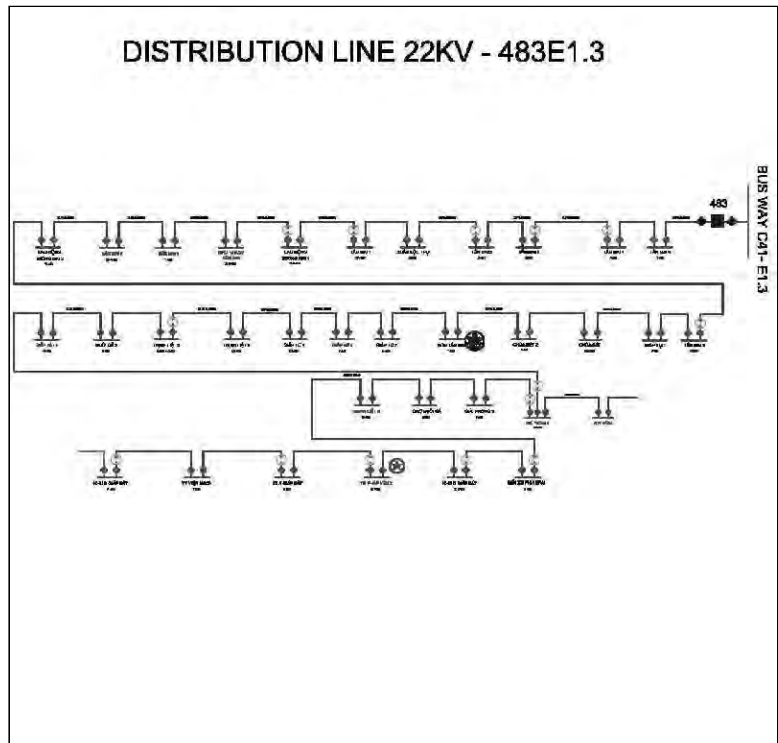
**Figure 2.67 Electric Power Distribution from Substation No.9 (at Nghia Do, Ha Noi)**



**Figure 2.67 Electric Power Distribution from Substation No.2 (at Thanh Xuan, Ha Noi)**



**Figure 2.67 Electric Power Distribution from Substation No.3 (at Mai Dong, Ha Noi)**



### **3. Legal Affairs**

#### **3.1 No. 23/2008/QH12: Law on Road Traffic**

THE NATIONAL ASSEMBLY

-----

No. 23/2008/QH12

SOCIALIST REPUBLIC OF VIET NAM  
Independence - Freedom - Happiness

-----

Hanoi, November 13, 2008

**LAW**

**ON ROAD TRAFFIC**

*Pursuant to the 1992 Constitution of the Socialist Republic of Vietnam, which was amended and supplemented under Resolution No. 51/2001/QH10;  
The National Assembly promulgates the Law on Road Traffic,*

**Chapter I.**

**GENERAL PROVISIONS**

**Article 1.** Scope of regulation

This Law prescribes road traffic rules; road infrastructure facilities, vehicles in traffic and road users, road transportation and state management of road traffic.

**Article 2.** Subjects of application

This Law applies to organizations and individuals related to road traffic on the territory of the Socialist Republic of Vietnam.

**Article 3.** Interpretation of terms

In this Law, the terms below are construed as follows:

1. Roads include roads, land bridges, tunnels and ferry landing stages.
2. Road works include roads, standing and parking places on roads, traffic light signals, road signs, road markings, marker posts, fences, traffic islands, median strips, milestones, walls, embankments, water drainage systems, vehicle mass inspection stations, toll stations and other support road works and equipment.
3. Road infrastructure facilities include road works, car terminals, parking lots, roadside service stations and other support works along the roads to serve traffic, and road safety corridors.
4. *Road land* means a land area on which road works are constructed and land areas along both sides of a road for road work management, maintenance and protection.
5. *Road safety corridor* means land strips along both sides of the road land, measuring from the outer edge of the road land outwards, to ensure road traffic safety.
6. *Carriageway* means the part of a road used by vehicular traffic.
7. *Lane* means a divided longitudinal strip of the carriageway which is wide enough for safe vehicular traffic.
8. *Size limit of road* means a space with limited height and width of a road, bridge, ferry landing stage or road tunnel so that vehicles, including loaded cargo, can safely pass.
9. *Street* means a road inside an urban area, which includes road bed and pavement.
10. *Median strip* is a part of a road that divides the road surface for the two opposite directions of traffic or divides the road sections for motor vehicles and rudimentary vehicles. Median strips are classified into fixed and mobile types.
11. *Level crossing* (below referred to as intersection) means any crossroad between two or more roads on the same level, including the open area formed by such intersection.
12. *Expressway* mean a road reserved only for motor vehicles, with median strips separating carriageways for the two opposite directions of traffic, without crossing at

level with any road, furnished with adequate support equipment and devices to ensure uninterrupted and safe traffic, shorten travel time, and with certain points for vehicle exits and entries.

13. *Main road* means a road ensuring major traffic in an area.

14. *Feeder road* means a road connected to a main road.

15. *Priority road* means a road vehicles moving on which are given way by those approaching from other directions when passing intersections, and which is signposted as priority road.

16. *Collector road* means a road that links the system of internal roads of an urban center, an industrial park, an economic zone, a trade-service center and other roads to a main road or a feeder road before connecting to a main road

17. *Road vehicle* means a road motor vehicle or a road rudimentary vehicle.

18. *Road motor vehicle* (below referred to as motor vehicle) means automobile; tractor; trailer or semi-trailer drawn by automobile or tractor; motorcycles, three-wheeled motor vehicle, moped (including electric moped) and the like.

19. *Road rudimentary vehicle* (below referred to as rudimentary vehicle) means bicycle (including motor bicycle), pedicab, vehicle for the disabled, animal-drawn cart and the like.

20. *Special-use vehicle* means construction vehicle, farm vehicle, forestry vehicle and other special-use vehicles used for defense and security purposes, which joins in road traffic.

21. *Vehicle joining in road traffic* means road vehicle or special-use vehicle.

22. *Road user* means operator or user of a vehicle joining in road traffic; person guiding or driving animals and pedestrian walking on the road.

23. *Operator* means operator of a motor vehicle, rudimentary vehicle or special-use vehicle joining in road traffic.

24. *Driver* means operator of a motor vehicle.

25. *Person directing traffic* means traffic police or person tasked to direct traffic at a place where road construction is underway, or traffic is congested, at a ferry landing stage and at a road bridge with a railroad track.

26. *Passenger* means person carried onboard a road passenger vehicle for which he/she has to pay a charge.

27. *Luggage* means articles a passenger carries along onboard a vehicle or consigned onboard another vehicle.

28. *Cargo* means machine, equipment, material, fuel, consumer goods, live animal and other movable property carried onboard a road vehicle.

29. *Dangerous cargo* means cargo containing a dangerous substance which, when carried by road, may cause harm to human life, health, the environment, safety and national security.

30. *Road transportation* means activities of using a road vehicle to carry people and cargoes by road.

31. *Carrier* means an organization or individual using a road vehicle to carry out road transportation activities.

32. *Road administration agency* means a specialized state management agency under the Ministry of Transport; specialized agencies of People's Committees of provinces and centrally run cities (below collectively referred to as provincial level), People's Committees of districts, towns and provincial cities (below collectively



referred to as district level) and People's Committees of communes and townships (below collectively referred to as commune level).

**Article 4. Road traffic principles**

1. Road traffic must be uninterrupted, orderly, safe and effective, contributes to socio-economic development, defense and security assurance and environmental protection.
2. Road traffic shall be developed according to planning towards modernization and synchronism; transportation by road shall be combined with other modes of transportation.
3. Road traffic administration shall be implemented uniformly on the basis of assignment and decentralization of specific responsibilities and powers and close coordination among ministries, branches and local administrations at all levels.
4. Ensuring road traffic order and safety is the responsibility of agencies, organizations and individuals.
5. Road users shall self-consciously and strictly observe traffic rules and ensure safety for themselves and others. Vehicle owners and operators shall take responsibility before law for ensuring that their vehicles operate safely in road traffic.
6. All acts of violating the road traffic law shall be detected and prevented in time and handled in a strict and lawful manner.

**Article 5. Policies on road traffic development**

1. The State concentrates resources on developing road traffic, prioritizing investment in developing road traffic infrastructure facilities in key economic regions, cities, mountainous, deep-lying, remote, border, island and ethnic minority regions; and adopts policies to mobilize resources for road administration and maintenance.
2. The State adopts the policy of prioritizing the development of mass transit and restricting the use of personal vehicles in cities.
3. The State encourages and creates conditions for Vietnamese and foreign organizations and individuals to invest in and commercially operate road infrastructure facilities and road transportation activities, and conduct research, apply scientific and technological advances and train human resources in the field of road traffic.

**Article 6. Road traffic and transportation planning**

1. The road traffic and transport planning is a specialized planning, including planning on infrastructure and planning on means of transport and road transportation.
2. The road traffic and transportation planning shall be formulated on the basis of the socio-economic development strategy, defense and security assurance and international integration, and in conformity with the sector's planning and close association with other specialized transport plans.
3. Each road traffic and transportation planning shall be elaborated for at least 10 years, setting development orientations for at least 10 subsequent years; and may be adjusted to take into account the socio-economic development in each period. Such adjustment must perpetuate the previous approved plans. An approved road traffic and transportation planning shall be publicized for concerned agencies, organizations and individuals to know, implement and supervise its implementation.
4. The road traffic and transportation planning must clearly identify development objectives, viewpoints, nature and scope; land use needs, funding needs, funding

sources and human resources, and lists of projects and priority projects; evaluate its impacts; and identify mechanisms, policies and solutions for its implementation.

5. The Ministry of Transport shall formulate national, inter-regional and regional road traffic and transportation plannings and plannings on national highways and expressways, collect opinions of concerned ministries, ministerial-level agencies and provincial-level People's Committees on these plannings before submitting them to the Prime Minister for approval.

6. Provincial-level People's Committees shall formulate and submit to the People's Councils of the same level for decision plannings on road traffic and transportation under local management. Before submitting them to the People's Councils of the same level for decision, they shall obtain opinions of the Ministry of Transport. For centrally run cities of special grade, their People's Committees shall formulate road traffic and transportation plannings and submit them to the People's Councils of the same level for adoption and obtain opinions of the Ministry of Transport and the Ministry of Construction before submitting them to the Prime Minister for approval.

7. Plannings on other technical infrastructure works must be compliant and synchronous with plannings on road infrastructure facilities.

8. The State ensures state budget funds and adopts policies to mobilize other funding sources for road traffic and transportation planning work.

**Article 7. Road traffic law propagation, dissemination and education**

1. Information and propaganda agencies shall regularly organize road traffic law propagation and dissemination among the entire population.

2. People's Committees at all levels shall, within the scope of their tasks and powers, organize road traffic law propaganda, dissemination and education in their localities and apply forms of propaganda and dissemination suitable to ethnic minority people.

3. Education and training state management agencies shall include the road traffic law in the teaching programs at schools and other educational establishments as suitable to each branch and each level of education.

4. Vietnam Fatherland Front and its member organizations shall coordinate with concerned agencies and local administrations in propagating and mobilizing the people to observe the road traffic law.

5. Agencies and organizations shall organize road traffic law propagation and dissemination among officials, soldiers, civil servants, public employees and other laborers under their management.

Family members shall propagate, educate and remind other members to observe the road traffic law.

**Article 8. Prohibited acts**

1. Destroying roads, road bridges, tunnels and ferry landing stages, light signals, marker posts, signs, dome mirrors, median strips, water drainage systems and other works and equipment of road traffic infrastructure.

2. Illegally digging, drilling and cutting roads; illegally placing or erecting hurdles on roads; placing and spreading pointed objects, pouring lubricants on roads; illegally leaving materials, wastes and garbage on roads; illegally opening passages and linking to main roads; illegally encroaching, occupying or using land of roads and road safety corridors; opening manhole covers without permission, illegally dismantling, removing or falsifying road works.

3. Illegally using roadbeds, roadsides and pavements.

4. Putting motor vehicles and special-use machines which fail to satisfy technical safety and environmental protection criteria into operation on roads.
5. Changing the chassis, components and accessories of motor vehicles in order to temporarily achieve their technical criteria before taking them for inspection.
6. Taking part in, cheering or organizing illegal vehicle races, driving vehicles recklessly on crowded streets or in zigzags.
7. Operating a road motor vehicle while there is narcotic in the operator's body.
8. Operating an automobile, tractor or special-use vehicle on the road while there is a concentration of alcohol in the operator's blood or breath.  
Operating a motorcycle or moped while there is a concentration of alcohol of over 50 milligrams per 100 milliliters of blood or 0.25 milligrams per 1 liter of breathed air.
9. Operating a motor vehicle without a driver license as prescribed.  
Operating a special-use vehicle on the road without a certificate of training in knowledge about the road traffic law, a license or certificate of operation of special-use vehicle.
10. Assigning one's motor vehicle or special-use vehicle to another person ineligible for operating vehicles in road traffic.
11. Operating a motor vehicle at a speed beyond the prescribed speed limit, recklessly passing or overtaking.
12. Honking and opening the throttle continuously; honking during the time from 22:00 hrs to 05:00 hrs, blowing the hoot, using driving lamps in urban and populous areas, except for priority vehicles moving on duty as provided for by this Law.
13. Fitting and using the horn and lamps at variance with the manufacturer design for each type of motor vehicles; using audible devices badly affecting traffic order and safety and public order.
14. Transporting goods banned from circulation, illegally transporting, or failing to fully observe regulations on transportation of, dangerous cargoes or wild animals.
15. Threatening, offending and fighting over passengers; compelling passengers to use services against their will; employing transshipment, disembarking passengers or committing other acts to evade detection of the carriage of cargoes or passengers in excess of prescribed limits.
16. Conducting commercial transportation by car when failing to meet all business conditions as prescribed.
17. Absconding after causing accidents in order to shirk responsibility.
18. Deliberately refusing to rescue victims of traffic accidents when having conditions to do so.
19. Infringing upon the lives, health and property of traffic accident victims and causers.
20. Taking advantage of traffic accidents to assault, intimidate, incite, pressure, foment disorder or obstruct the handling of traffic accidents.
21. Abusing one's position, power or profession to breach the road traffic law.
22. Illegally manufacturing, using or buying or selling number plates of motor vehicles and special-use vehicles.
23. Acts of breaching road traffic rules and other acts endangering road users and vehicles in road traffic.

## **Chapter II. ROAD TRAFFIC RULES**

### **Article 9. General rules**

1. Road users shall keep to the right in their travel direction, move on the prescribed lane or road section and obey the road signal system.
2. The driver and persons sitting on the front seats of a car equipped with safety belts shall wear the safety belts.

**Article 10.** Road signal system

1. The road signal system includes instructions given by persons directing traffic; traffic light signals, road signs, road markings, marker posts or protection walls and barriers.
2. Instructions given by persons directing traffic:
  - a/ Arm raised upright constitutes a signal that road users approaching from any direction must stop;
  - b/ One or two arms outstretched horizontally constitutes a signal that road users in front of or behind the person directing traffic must stop while road users on the right and the left of the person directing traffic may proceed;
  - c/ Right arm outstretched to the front constitutes a signal that road users behind and on the right of the person directing traffic must stop; road users in front of the person directing traffic may turn right; road users on the left of the person directing traffic may proceed in all directions; and pedestrians crossing the road must walk behind the person directing traffic.
3. The traffic light signals are in three colors, each having the following meaning:
  - a/ A green light means proceed;
  - b/ A red light means stop;
  - c/ An amber light means stop behind the stop line, except for road users who have passed the stop line and may keep moving; in case of a flashing amber light signal, road users may proceed but shall slow down and give way to pedestrians;
4. Road signs are divided into 5 groups, with the meaning of each group as follows:
  - a/ Prohibitive signs indicate prohibitions;
  - b/ Danger warning signs warn dangerous circumstances likely to occur;
  - c/ Mandatory signs indicate instructions to be obeyed;
  - d/ Direction signs indicate traffic directions or necessary information;
  - e/ Additional panels additionally explain prohibitive signs, danger warning signs, mandatory signs or direction signs.
5. Road markings indicate the division of lanes, travel positions or directions, stop positions.
6. Marker posts or protection walls are erected at the edge of dangerous road sections to notify road users of the safety scope of the road foundation and of the road direction.
7. Barriers are erected at places where roads are narrowed, at bridge heads, sluice heads, no-entry roads, dead-end roads not open to vehicles and pedestrians, or at places where traffic should be controlled and supervised.
8. The Minister of Transport shall issue specific regulations on road signs.

**Article 11.** Compliance with road signals

1. Road users shall comply with instructions and indications of the road signal system.
2. When there are persons directing traffic, road users shall comply with their instructions.
3. Where there exist both a fixed sign and a temporary sign, road users shall comply with the instruction conveyed by the temporary sign.

4. At pedestrian crossings, operators shall observe, slow down and give way to pedestrians and wheelchairs of the disabled to cross the road.

At places where there is no pedestrian crossing, operators shall observe and, if seeing a pedestrian or a wheelchair of a disabled crossing the road, slow down and give way to the pedestrian or the wheelchair of the disabled to safely cross the road.

**Article 12.** Speed and distance between vehicles

1. Drivers and operators of special-use vehicles shall comply with regulations on the speed limits of vehicles moving on the roads and keep at a safe distance from a vehicle moving ahead; at places where there is a sign indicating the “minimum distance between two vehicles”, they shall keep at a distance not shorter than that indicated.

2. The Minister of Transport shall issue regulations on the speed limits of vehicles and the placement of speed limit signs; and organize the placement of speed limit signs along national highways.

3. Provincial-level People’s Committee presidents shall organize the placement of speed limits signs along locally managed roads.

**Article 13.** Use of lanes

1. On a road with many lanes in the same direction of traffic, distinguished from one another by the lane-dividing markings, operators shall keep their vehicles on one lane and may only change lanes at places where it is so permitted; when changing lane, they shall give signals indicating their intention and ensure safety.

2. On a one-way road with a lane-dividing marking, rudimentary vehicles shall keep to the right lane close to the edge of the road while motor vehicles and special-use vehicles move on the left lane.

3. Vehicles moving on the road at a lower speed shall keep to the right.

**Article 14.** Overtaking

1. Before overtaking a vehicle shall give a signal by means of light or horn; from 22.00 hrs to 05.00 hrs in urban centers and populous areas, only light signals can be used for this purpose.

2. The overtaking vehicle may overtake only where there is no obstacle ahead, no oncoming vehicle in the road section intended for overtaking and the vehicle ahead has not given a signal to overtake another and has moved toward the right side.

3. When there is a vehicle intending to overtake, if safety can be assured, the operator of the vehicle ahead shall slow down, move close to the right of the carriageway till the following vehicle has passed and may not cause obstructions to the overtaking vehicle.

4. When overtaking, a vehicle shall do so on the left side, except for the following cases where it can overtake on the right side:

a/ When the vehicle ahead has given a signal to turn left or is turning left;

b/ When a tram is running in the middle of the road;

c/ When a special-use vehicle is operating on the road, making overtaking on the left impossible.

5. Overtaking is forbidden in the following cases:

a/ The conditions prescribed in Clause 2 of this Article are not met;

b/ There is only a single line of vehicular traffic on a narrow bridge;

c/ On a bend, at the crest of a slope and at a place with insufficient visibility;

d/ At an intersection or a level crossing between a road and a railroad track;

e/ When weather conditions or road conditions do not ensure safe overtaking;

f/ A priority vehicle is emitting a priority signal.

**Article 15.** Change of direction

1. When wishing to change direction, the operator shall slow down and give a signal of the turning direction.
2. While changing direction, the driver or operator of a special-use vehicle shall allow pedestrians and bicycle riders moving on the road sections reserved for them to pass, give way to oncoming vehicles and shall change direction only when seeing that his/her vehicle does not obstruct or endanger people and other vehicles.
3. In residential areas, the driver may make U-turns only at intersections and places with a sign permitting U-turns.
4. It is prohibited to make U-turns at road sections reserved for pedestrians to cross, on bridges, at bridge heads, under flyovers, at undergrounds, in road tunnels, on expressways, at level crossings between a road and a railroad track, on narrow roads, steep roads or on bends with insufficient visibility.

**Article 16.** Reversing

1. When reversing his/her vehicle, the operator shall observe behind, give a necessary signal and may reverse only when realizing no danger.
2. It is forbidden to reverse in areas where reversing is prohibited, on road sections reserved for pedestrians to cross, at intersections or level crossings between a road and a railroad track, at places with insufficient visibility, in road tunnels or on expressways.

**Article 17.** Passing of oncoming traffic

1. On a road which is not divided into two separate directions of traffic, when passing an oncoming vehicle, the operator shall slow down and move to the right along his/her direction of traffic.
2. Cases of giving way when passing an oncoming vehicle:
  - a/ At a narrow road section which permits only one vehicle to move and where a lay-by is available, the vehicle which is closer to the lay-by shall pull in to the lay-by, allowing the other vehicle to pass;
  - b/ The vehicle moving downhill shall allow the vehicle moving uphill to pass;
  - c/ The vehicle facing an obstruction ahead shall allow the other vehicle to pass.
3. When passing each other, two motor vehicles moving in the opposite directions may not use the driving lamp.

**Article 18.** Standing and parking on roads

1. Standing vehicle is a vehicle that is stationary for the time needed to pick up or set down persons or to load or unload goods or to do other things.
2. Parked vehicle is a vehicle that is stationary for an unlimited time.
3. When standing or parking his/her vehicle on a road, the operator shall comply with the following provisions:
  - a/ To give a signal to operators of other vehicles;
  - b/ To stand or park his/her vehicle at places with large roadsides or on land plots outside the carriageway; where the roadside is narrow or not available, to stand or park the vehicle close to the right edge of the carriage along the direction of traffic;
  - c/ Where a car stop or a parking lot has been built or designated, to stand or park the vehicle at such place;
  - d/ After parking the vehicle, the operator may leave the vehicle only after taking safety measures, if the parked vehicle occupies part of the carriageway, the operator

- shall place danger warning signs in front of and behind the vehicle for the operators of other vehicles to notice;
- e/ Not to open the door of the vehicle or leave it open or alight from the vehicle when safety conditions are not assured;
  - f/ When standing the vehicle, not to shut down the engine and leave the driving seat;
  - g/ The vehicle parked on a steep road must have its wheels chocked.
4. It is forbidden to stand or park a vehicle at the following positions:
- a/ On the left side of one-way carriages;
  - b/ On bends and close the crests of slopes with insufficient visibility;
  - c/ On bridges, under flyovers;
  - d/ In parallel with another standing or parked vehicle;
  - e/ On pedestrian crossings;
  - f/ At an intersections and within 5 meters from the edge of the intersection;
  - g/ At bus stops;
  - h/ In front of and within 5 meters from both sides of the entrances of offices of agencies or organizations;
  - i/ At road sections wide enough for only line of traffic;
  - j/ Within railroad tracks' safety areas;
  - k/ At places where the vehicle would conceal road signs.

**Article 19.** Standing and parking on streets

When standing or parking his/her vehicle on street, the operator shall comply with the provisions of Article 18 of this Law and the following provisions:

1. To stand or park the vehicle close to the right kerb or pavement of the street along the direction of traffic, with the distance between the nearest wheel and the kerb or pavement not exceeding 0.25 m and without obstructing or endangering traffic. In narrow streets, to stand or park the vehicle at positions at least 20 meters away from the vehicle parked on the other side.
2. Not to stand or park the vehicle on tramways, on manholes of water drainage sewers, or openings of telephone or high-voltage electricity trenches or places exclusively reserved for fire engines to get water. Not to leave the vehicle on roadbed or pavement in contravention of regulations.

**Article 20.** Loading of cargoes on vehicles

1. Cargoes loaded on a vehicle must be neatly arranged and firmly fastened, must not fall on to the road, and must not be trailed on the road and affect the driving of the vehicle.
2. Loaded cargoes projecting beyond the front or rear of the vehicle must be marked with a red flag by daytime or a red light at night or when it is dark.
3. The Minister of Transport shall issue specific regulations on the loading of cargoes on road vehicles.

**Article 21.** Carriage of persons on cargo vehicles

1. Persons may only be carried on cargo vehicles in the following cases:
  - a/ Carrying persons to perform natural disaster prevention and combat tasks or urgent tasks; carrying people's armed force officers and soldiers to perform their duties; carrying victims to hospital;
  - b/ Carrying road maintenance and repair workers; carrying learner drivers on driving practice cars; carrying persons forming a procession;
  - c/ Evacuating persons out of dangerous areas or in other cases of emergency as prescribed by law.

2. Vehicles carrying persons in the cases specified in Clause 1 of this Article must have a fixed trunk, ensuring traffic safety.

**Article 22.** Priority rights of a number of vehicles

1. The following vehicles have the priority right to go before other vehicles when passing intersections from any direction of traffic in the following order:

a/ Fire engines traveling on duty;

b/ Military vehicles and police vehicles on urgent duty; motorcades led by police cars;

c/ Ambulances on duty;

d/ Dike-watch vehicles, vehicles employed in overcoming natural disasters or epidemics or in a state of emergency as prescribed by law;

e/ Funeral vehicle processions.

2. Vehicles specified at Points a, b, c and d of Clause 1, this Article, when traveling on duty, shall give signals by means of horn, banner and light according to regulations; are not restricted in speed; may enter one-way roads from the opposite direction and other roads open to traffic, even go through the red light, and must only follow the instructions of persons directing traffic.

The Government shall issue specific regulations on signals of priority vehicles.

3. When recognizing the signals of priority vehicles, road users shall promptly slow down, give way or pull in to the right edge of the carriageway to give way. They may not obstruct priority vehicles.

**Article 23.** Crossing by ferry boat and pontoon bridge

1. When reaching a ferry landing stage or pontoon bridge, vehicles must line up at the prescribed place without obstructing traffic.

2. When a vehicle embarks, is on board and disembarks a ferry boat, all passengers shall alight from the vehicle, except operators of motor vehicles or special-use vehicles, sick people, old people and disabled people.

3. Motor vehicles and special-use vehicles will be the first to embark a ferry boat, followed by rudimentary vehicles and people; when disembarking a ferry boat, people will come up first, then vehicles under the guidance of persons directing traffic.

4. Priority order for crossing by ferry boat or pontoon bridge:

a/ Priority vehicles specified in Clause 1, Article 22 of this Law;

b/ Mail vans;

c/ Fresh and raw foodstuff trucks;

d/ Public passenger cars.

When many priority vehicles of the same kind concurrently arrive at a ferry landing stage or pontoon bridge, the vehicle which arrives first is entitled to cross first.

**Article 24.** Giving way at intersections

When approaching an intersection, the operator of a vehicle shall slow down and give way according to the following provisions:

1. At an intersection without signals to move around the roundabout, to give way to vehicles approaching from the right;

2. At an intersection with signals to move around the roundabout, to give way to vehicles approaching from the left;

3. At an intersection between a priority road and a non-priority road or between a feeder road and a main road, the vehicle coming from the non-priority road or the feeder road must give way to the vehicle moving on the priority road or the main road from any direction of traffic.



**Article 25.** Traveling on level-crossings between roads and railroad tracks or bridges with railroad tracks

1. At a level crossing between a road and a railroad track or a bridge with a railroad track, the rail-borne vehicle has the priority right to go first.
2. At a level crossing between a road and a railroad track which is equipped with light signals, barriers and signaling bell, when the red light is on, signaling bell ringing or the barriers moving or closed, road users shall stop on their road section at a safe distance from the barriers; they may cross only when the red light is off, the barriers are fully opened and the signaling bell stops ringing.
3. At a level crossing between a road and a railroad track which is equipped with light signals or signaling bell only, when the red light is on or signaling bell ringing, road users shall stop at a distance of at least 5 meters from the nearest track; they may cross only when the red light is off or the signaling bell stops ringing.
4. At a level crossing between a road and a railroad track which is equipped with no light signals, barriers and signaling bell, road users shall look both sides and cross only if they ascertain that no rail-borne vehicle is approaching; if seeing that a rail-borne vehicle is approaching, they shall stop at a distance of at least 5 meters from the nearest track and may cross only when the rail-borne vehicle has passed.
5. When a vehicle breaks down right at a level crossing between a road and a railroad track or within the railroad safety area, its operator shall by all fastest ways place signals on the railroad track at least 500 meters on the both sides of the vehicle in order to warn the operators of rail-borne vehicles and seek ways to report such to the nearest railroad or station manager, and at the same time take every measure to move the vehicle off the railroad safety area as soon as possible.
6. Those who are present at the place where a vehicle breaks down at a level crossing between a road and a railroad track have the duty to help the operator move the vehicle off the railroad safety area.

**Article 26.** Traffic on expressways

1. Drivers and operators of special-use vehicles traveling on expressways, apart from complying with traffic rules provided in this Law, shall also observe the following provisions:
  - a/ When entering an expressway, to give signals indicating the intention to do so and give way to vehicles traveling on the expressway, only when making sure that it is safe can they join in the traffic lane on the lane close to the edge of the expressway; if there is an acceleration lane, they shall use it before moving into the expressway lane;
  - b/ When exiting an expressway, to move gradually to the right lane, if there is a deceleration lane, they shall enter such lane before leaving the expressway;
  - c/ Do not move on the emergency-stop lane or the verge;
  - d/ Do not move beyond the maximum speed and below the minimum speed, which are indicated on the road signs or painted road markings.
2. Drivers or operators of special-use vehicles shall keep at a safe distance from one another as indicated on the road signs.
3. To stand or park their vehicles only at the prescribed places; where they are compelled to stand or park their vehicles outside the prescribed places, the drivers shall move their vehicles off the carriageway; if unable to do so, they shall give signals to the drivers of other vehicles.

4. Pedestrians, rudimentary vehicles, motorcycles, mopeds and tractors; and special-use vehicles with a design speed of less than 70 km/h may not enter expressways, except persons, vehicles and equipment used for expressway administration and maintenance.

**Article 27.** Traffic in road tunnels

Operators of vehicles traveling in road tunnels, apart from complying with traffic rules provided in this Law, shall also observe the following provisions:

1. Motor vehicles and special-use vehicles must switch on their lamps and rudimentary vehicles must switch on their lamps or carry luminous signal devices;
2. They may only stand and park their vehicles at prescribed places.

**Article 28.** Load-bearing capacity and size limits of roads

1. Operators shall comply with regulations on load-bearing capacity and size limits of roads and submit to the inspection by competent agencies.
2. In special cases, vehicles which are overloaded or oversized beyond the size limits of roads and caterpillars which damage road surface may operate on the roads provided that they obtain permits of road administration agencies and take compulsory measures to protect roads and ensure traffic safety.
3. The Minister of Transport shall issue regulations on the load-bearing capacity and size limits of roads, publicize the load-bearing and size limits of national highways; prescribe the grant of permits for overloaded and oversized vehicles and road surface-damaging caterpillars.
4. Provincial-level People's Committee presidents shall publicize the load-bearing capacity and size limits of locally managed roads.

**Article 29.** Vehicles pulling vehicles or trailers

1. An automobile may only pull another automobile or special-use vehicle when the latter cannot move on its own and must comply with the following provisions:
  - a/ The pulled automobile must have an operator and its steering system must still be effective;
  - b/ The coupling with the pulled automobile must be secure and safe; if the brake system of the pulled automobile is no longer effective, the pulling and the pulled automobile must be coupled by a hard rod;
  - c/ There must be signs at the front of the pulling automobile and the rear of the pulled automobile.
2. An automobile pulling a trailer must have its total mass bigger than that of the trailer or must have a brake system effective for trailers.
3. The following acts are prohibited:
  - a/ An automobile pulling a trailer or semi-trailer coupled with another trailer or automobile;
  - b/ Carrying people on the pulled automobile;
  - c/ Pulling a rudimentary vehicle, motorcycle or moped.

**Article 30.** Operators of and passengers on motorcycles and mopeds

1. The operator of a motorcycle or moped may carry only one person, except for the following cases in which carrying two persons at most is permitted:
  - a/ Carrying sick persons for emergency medical treatment;
  - b/ Escorting a person who has committed an illegal act;
  - c/ Carrying children under 14 years of age.
2. The operators and passengers of motorcycles, three-wheeled motor vehicles or mopeds shall wear safety helmets, properly fastening their chin straps.

3. Operators of motorcycles, three-wheeled motor vehicles or mopeds are prohibited from:

- a/ Traveling abreast;
- b/ Traveling in road sections reserved for pedestrians and other vehicles;
- c/ Using umbrellas, mobile phones and audible devices, except hearing aids;
- d/ Pulling and pushing other vehicles or objects, and carrying bulky objects;
- e/ Operating the vehicle without holding the handlebars or on one wheel, for two-wheeled vehicles, or on two wheels, for three-wheeled vehicles;
- f/ Other acts badly affecting traffic order and safety.

4. Passengers of motorcycles, three-wheeled motor vehicles or mopeds in traffic are prohibited from:

- a/ Carrying bulky objects;
- b/ Using umbrellas;
- c/ Clinging to, pulling or pushing other vehicles;
- d/ Standing on the saddle or pillion, or sitting on the handlebars;
- e/ Other acts badly affecting traffic order and safety.

**Article 31.** Riders of and passengers on bicycles, operators of other rudimentary vehicles

1. Bicycle riders may carry only one person or two persons including an under-7 child. Bicycle riders shall comply with the provisions of Clause 3, Article 30 of this Law; passengers on bicycles traveling on the roads shall comply with the provisions of Clause 4, Article 30 of this Law.

2. Operators of and passengers on motor bicycles shall wear safety helmets, properly fastening their chin straps.

3. Operators of other rudimentary vehicles may not travel two or more abreast, shall travel on the lane reserved for rudimentary vehicles, if such lane is available; when traveling at night, these vehicles must have signals at their front and rear. Operators of animal-drawn carts shall take measures to ensure public sanitation.

4. Goods loaded on rudimentary vehicles must ensure safety, without obstructing traffic and the operator's view.

**Article 32.** Pedestrians

1. Pedestrians shall use pavements or verges; where pavements and verges are not available, they shall walk close to the edge of a road.

2. Pedestrians may cross a road at places where there are light signals, road markings or flyovers or tunnels reserved for pedestrians, and shall comply with the instructions given by such lights.

3. At places where light signals, road markings, flyovers or tunnels reserved for pedestrians are not available, pedestrians, before crossing a road, shall watch approaching vehicles, may cross the road when it is safe and shall take responsibility to ensure safe crossing.

4. Pedestrians may not walk over the median strip and cling to moving vehicles; if carrying bulky objects, they shall ensure safety and no obstruction to road users and vehicles in traffic.

5. Children under 7 years, when crossing an urban street or a road with regular vehicular traffic, must be led by adults; everyone has the duty to help children under 7 years cross roads.

**Article 33.** Disabled, old road-users

1. Disabled persons traveling in wheel chairs propelled by themselves may travel on pavements and marked pedestrian crossings.
2. Visually handicapped persons, when traveling on roads, must be led by other persons or have a device to signal other persons that they are visually handicapped.
3. Everyone has the duty to assist disabled persons and old persons in crossing roads.

**Article 34.** Persons guiding animals on roads

1. Persons guiding animals on roads shall keep them close to the edge of the carriageway and ensure road sanitation; if they need to lead the animals to cross a road, they shall watch out traffic and may only guide them cross the road when it is safe.
2. It is forbidden to guide animals go on road sections reserved for motor vehicles.

**Article 35.** Other activities on roads

1. The organization of cultural and sport activities, processions, festivals on roads must comply with the following provisions:
  - a/ Agencies or organizations wishing to use roads for cultural and sport activities, processions or festivals shall obtain written agreement of competent road administration agencies on traffic assurance plans before applying for permits to organize these activities in accordance with law;
  - b/ When necessary to restrict traffic on or close a road, the road administration agency shall issue announcements on traffic directions; agencies or organizations mentioned at Point a, Clause 1 of this Article shall organize the publication of these announcements on the mass media and take measures to ensure order and safety for road users and vehicles in traffic;
  - c/ The People's Committees of localities where cultural sports activities, processions or festivals are organized shall direct local functional agencies to organize and ensure safe traffic in areas where these activities are organized.
2. The following acts are prohibited:
  - a/ Holding markets, buying and selling goods on roads;
  - b/ Illegally gathering people on roads;
  - c/ Leaving animals unattended on roads;
  - d/ Drying paddy, rice stock and straw, agricultural products and other objects on roads;
  - e/ Placing advertisement billboards on road land;
  - f/ Installing boards, advertisement billboards or other equipment distracting road user attention to, and misleading the meanings of, road signs, or obstructing road users;
  - g/ Concealing road signs and traffic light signals;
  - h/ Using skateboards or roller-skates or similar equipment on the carriageways;
  - i/ Other acts obstructing traffic.

**Article 36.** Use of streets and other activities on streets

1. Roadbeds and pavements are used only for traffic purposes;
2. Other activities on streets must comply with Clause 1, Article 35 of this Law; in special cases, temporary use of parts of roadbeds and pavements for other purposes is subject to regulations of provincial-level People's Committees and must not affect traffic order and safety.
3. The following acts are prohibited:
  - a/ Acts specified in Clause 2, Article 35 of this Law;
  - b/ Dumping garbage or wastes not at prescribed places;

c/ Illegally building or placing platforms or stands on streets.

**Article 37.** Organization of traffic and direction of traffic

1. Organization of traffic covers the following contents:

a/ Dividing lanes, flows and routes and prescribing travel time for people and road vehicles;

b/ Stipulating no-entry road sections, one-way roads, no-standing, no-parking and no-U-turn places; installing road signs;

c/ Announcing temporary or permanent changes in lane or route division and traffic time; taking measures in response to incidents and other road traffic measures to ensure uninterrupted and safe traffic.

2. Responsibility to organize traffic:

a/ The Minister of Transport shall organize traffic on the national highway system;

b/ Provincial-level People's Committee presidents shall organize traffic on the road systems under their management.

3. Traffic police's responsibility to direct traffic:

a/ To instruct and direct traffic on roads; guide or compel road users to observe traffic rules;

b/ Upon the occurrence of circumstances which cause traffic jams or other urgent requirements to ensure security and order, to suspend traffic on certain road sections, re-arrange traffic flows or routes and temporary standing and parking places.

**Article 38.** Responsibilities of individuals, agencies and organizations when traffic accidents occur

1. Operators and persons directly involved in a traffic accident shall:

a/ Immediately stop their vehicles; keep unchanged the conditions at the site of the accident; give first aid to the victims and show up at the request of competent agencies;

b/ Remain on the scene of the accident until the arrival of the police, except for cases in which the operator has also been injured and must be carried for emergency medical treatment or has to carry the victim for emergency medical treatment or his/ her life is threatened, but shall later report himself/ herself to the nearest police office;

c/ Provide true information on the accident to competent agencies.

2. Persons present at the place where an accident occurs have the following responsibilities:

a/ Protect the scene;

b/ Provide timely assistance and medical treatment to the victims;

c/ Immediately report to the nearest police office, health agency or People's Committee;

d/ Protect the victims' property;

e/ Provide true information on the accident at the request of competent agencies.

3. Operators of other vehicles, when passing the places of accidents, have the responsibility to carry the victims for emergency medical treatment. Priority vehicles and vehicles carrying persons entitled to diplomatic privileges and immunities are not compelled to comply with this Clause.

4. Upon receiving a report on an accident, the police office shall promptly send police officers to the scene to investigate the accident and collaborate with the road administration and local People's Committee to ensure uninterrupted and safe traffic.

5. The commune-level People's Committee of the place where an accidents occurs shall promptly inform the police office and health agency of the accident for handling

the accident; organize the treatment and assistance of the victims, the protection of the scene and the victims' property; in case the victim dies and his/her identity is unknown or he/ she has no relatives or his/her relatives cannot afford his/her burial, after competent state agencies have completed all work as prescribed by law and permitted the burial, the commune-level People's Committee shall organize the burial. For an accident falling beyond its ability, the commune-level People's Committee shall report it to the higher-level People's Committee

6. The Ministry of Public Security shall make statistics, sum up and develop a database on road traffic accidents and make it accessible to agencies, organizations and individuals in accordance with law.

### **Chapter III.**

#### **ROAD INFRASTRUCTURE FACILITIES**

##### **Article 39. Road classification**

1. The road network consists of six systems, including national highways, provincial roads, district roads, communal roads, urban roads and special-use roads, which are prescribed as follows:

a/ National highways are roads connecting Hanoi capital with provincial-level administrative centers; roads connecting provincial-level administrative centers of three or more localities; road connecting an international seaport or airport to international border gates or major border gates; roads especially important to local or regional socio-economic development;

b/ Provincial roads are roads connecting provincial-level administrative centers with administrative centers of districts or adjacent provinces; roads important to provincial socio-economic development;

c/ District roads are roads connecting administrative centers of districts with administrative centers of communes, commune clusters or adjacent districts; roads important to district socio-economic development;

d/ Commune roads are roads connecting administrative centers of communes with villages and hamlets or equivalent units or connecting adjacent communes; roads important to commune socio-economic development;

e/ Urban roads are roads within the administrative boundaries of inner cities;

f/ Special-use roads are roads exclusively used for the transportation and travel of one or more than one agency, organization or individual.

2. The competence to classify and adjust road systems is prescribed below:

a/ The Minister of Transport shall decide on the national highway system;

b/ Provincial-level People's Committee presidents shall decide on systems of provincial roads and urban roads after reaching agreement with the Ministry of Transport (for provincial roads) or the Ministry of Transport and the Ministry of Construction (for urban roads);

c/ District-level People's Committee presidents shall decide on systems of district roads and commune roads after obtaining the approval of provincial-level People's Committee presidents;

d/ Agencies, organizations and individuals with special-use roads shall decide on systems of special-use roads after obtaining written consent of the Minister of Transport, for special-use roads linking with national highways; written consent of provincial-level People's Committee presidents, for special-use roads linking with provincial roads, urban roads or district roads; or written consent of district-level People's Committee presidents, for special-use roads linking with commune roads.

**Article 40.** Naming and numbering of roads

1. Roads shall be named or numbered as follows:

a/ Roads may be named after well-known persons, persons with merits to the country or historical or cultural relics or events and place names or by naming practice; roads may be numbered using natural numbers added with a letter, when necessary; if the name of an urban road is identical to that of a national highway, both the name of the urban road and the name and number of the national way can be used;

b/ The names and numbers of roads forming part of a regional or international road network shall be given according to agreements between Vietnam and concerned countries. For roads connected with a regional or international road network, both of their domestic and regional or international names and numbers can be used.

2. The naming and numbering of roads shall be decided by agencies with road-classifying competence; particularly for urban and provincial roads, their naming shall be decided by provincial-level People's Councils at the proposal of the People's Committees of the same level.

3. The Government shall issue specific regulations on the naming and numbering of roads.

**Article 41.** Road technical standards

1. Roads are technically graded into expressways and roads of other technical grades.

2. Newly built roads must satisfy technical standards of their relevant grade; roads currently in use but not yet graded shall be renovated and upgraded to reach technical standards of relevant grades; special-use roads must also have their own standards prescribed by law.

3. Responsibilities of ministries are defined as follows:

a/ The Ministry of Transport shall formulate, and guide the implementation of, technical standards of roads of all grades;

b/ The Ministry of Science and Technology shall promulgate national technical standards for roads of all grades.

4. The application of foreign technical standards to roads is subject to approval of competent state management agencies.

**Article 42.** Land funds reserved for road infrastructure facilities

1. Land funds for road infrastructure facilities shall be determined in road infrastructure plannings. Provincial-level People's Committees shall determine and manage land funds reserved for road infrastructure construction projects according to the approved planning.

2. The proportion of land for urban traffic to urban construction land must be between 16% and 26%. The Government shall prescribe specific land proportions suitable to each type of urban centers.

**Article 43.** Land areas reserved for roads

1. A land area reserved for a road includes the land for such road and the road safety corridor.

2. Within a land area reserved for a road, it is strictly forbidden to build other works, except for a number of essential projects which cannot be built outside such area, provided that permission of competent agencies is obtained, including defense and security works, road administration and exploitation works, telecommunications and electricity works, water supply and drainage, petrol, oil and gas pipelines.

3. Within a road safety corridor, in addition to complying with Clause 2 of this Article, the road safety corridor land may be temporarily used for agricultural and advertisement purposes without affecting road work and traffic safety. The erection of advertisement billboards within the road safety corridor is subject to written approval of road administration agencies.

4. Current users of law-recognized land areas within the road safety corridor may continue using these land areas for already identified purposes without impeding the safe protection of road works.

If such land use affects the safe protection of road works, land users and work owners shall take measures to redress the problem; otherwise the State will recover the land areas and pay compensations under law.

5. The Government shall issue specific regulations on land areas reserved for roads, the use and exploitation of road safety corridor land, and the construction of essential works within land areas reserved for roads.

**Article 44.** Assurance of technical requirements and traffic safety of road works

1. Newly built, upgraded or renovated road works must ensure technical standards and conditions on traffic safety for road users and vehicles in traffic, including pedestrians and disabled people. Urban roads must have pavements, road sections, flyovers and tunnels and traffic organized for pedestrians and disabled people to travel safely and conveniently.

2. Road works must be appraised in terms of traffic safety from the time of project elaboration, designing and construction and throughout the use process. Investment deciders and investors shall take into account traffic safety appraisal results for additional approval of projects.

3. Urban centers, industrial parks, economic zones, residential areas, commercial and service quarters and other works must have collector road systems built outside the road safety corridor; and ensure a distance from national highways as stipulated by the Government.

4. Road connection is provided as follows:

a/ Collector roads must be connected to branch roads, if branch roads are available;

b/ If branch roads or collector roads are to be directly connected to the main road, their connection points must be permitted by a competent road state administration agency right at the stage of project formulation and designing;

c/ The connection of paths from urban centers, industrial parks, economic zones, residential areas, commercial and service quarters and other works to roads must comply with regulations of the Minister of Transport.

5. Along with highway sections running through residential areas, there must be collector roads to serve people's daily-life activities.

**Article 45.** Road sign works

1. Road sign works include:

a/ Traffic light signals;

b/ Signs;

c/ Marker posts, barriers or protection fences;

d/ Road markings;

e/ Milestones;

f/ Other sign works.

2. Before being put into use, roads must be fully equipped with road sign works according to the approved designs.



3. It is prohibited to affix to road sign works any objects not related to the meanings and purposes of road sign works.

**Article 46.** Investment in construction and exploitation of road infrastructure facilities

1. Investment in the construction of road infrastructure facilities is investment in the construction, upgrading and renovation of road infrastructure facilities.

2. Investment in the construction of road infrastructure facilities must be in line with the road transportation planning already approved by competent authorities; comply with the process of investment and construction management and other legal provisions; and ensure technical standards of different grades of roads, landscape and environmental protection.

3. Vietnamese and foreign organizations and individuals may invest in the construction and commercial operation of road infrastructure facilities in accordance with law.

4. Competent People's Committees shall assume the prime responsibility for ground clearance according to land recovery decisions of competent state agencies and create favorable conditions for organizations and individuals to invest in the construction and commercial operation of road infrastructure facilities.

5. Road infrastructure facilities, once constructed, upgraded or renovated, must be checked by competent agencies before it can be put into use.

**Article 47.** Construction of works on road currently in use

1. The construction of works on roads currently in use may be carried out only after permits of competent state agencies are obtained and must be in line with such permits and the law on construction.

2. In the course of construction, construction units shall put up signs and temporary fences at construction sites and take measures to ensure uninterrupted and safe traffic.

3. The construction or works on urban roads must comply with the provisions of Clauses 1 and 2 of this Article and the following provisions:

a/ Road digging may only be permitted for repairing works or building new technical tunnels along or across roads but according to annual plans which have been consented by the road administration agency, except for unexpected cases;

b/ There must be construction plans and schedules suitable to the characteristics of each street to ensure no traffic congestion;

c/ Upon the completion of construction, the road must be restored to its original conditions; for underground works, a dossier on construction completion must be compiled and handed over to the road administration agency.

4. Construction units shall take responsibility before law for failure to take measures to ensure uninterrupted and safe traffic according to regulations, for the occurrence of traffic accidents, traffic jams or serious environmental pollution.

**Article 48.** Road administration and maintenance

1. Road maintenance means activities of maintaining and repairing roads in order to preserve technical standards of roads currently in use.

2. Roads, after being put into use, must be administered and maintained as follows:

a/ Monitoring of the conditions of road works; organization of traffic; examination and inspection of the protection of road infrastructure facilities;

b/ Regular maintenance and regular and irregular repair.

3. Road administration and maintenance responsibilities are defined as follows:

a/ The Ministry of Transport is responsible for the national highway system;

b/ Provincial-level People's Committees are responsible for the systems of provincial roads and urban roads. The administration and maintenance of systems of district and commune roads shall be prescribed by provincial-level People's Committees;  
c/ Special-use roads and roads not under state management and exploitation and roads built with non-state budget funding sources shall be administered and maintained by investors according to regulations.

4. The Minister of Transport shall issue regulations on road administration and maintenance.

**Article 49.** Financial sources for road administration and maintenance

1. Fundings for the administration and maintenance of national highways and local roads come from road maintenance funds.

Fundings for the administration and maintenance of special-use roads and roads not under state management and exploitation and roads built with non-state budget funding sources are covered by their administration and exploitation organizations and individuals.

2. Road maintenance funds shall be formed from the following sources:

a/ Annual state budget allocations;

b/ Revenue sources related to road use and other revenue sources as prescribed by law.

3. The Government shall issue specific regulations on the setting up, management and use of road maintenance funds at central and local levels.

**Article 50.** Building of level crossings between roads and railroad tracks

The construction of level crossings between roads and railroad tracks is subject to permission of competent state agencies, and must have designs which ensure technical standards and traffic safety conditions and have been approved by competent state agencies according to regulations of the Minister of Transport.

**Article 51.** Car terminals, parking lots, roadside service stations, vehicle mass inspection stations and road toll stations

1. In urban centers, the construction of working offices, schools, hospitals, trade and service centers, cultural centers and residential quarters must include the construction of parking lots suitable to the works' sizes.

2. Car terminals, parking lots and roadside service stations must be built according to plannings already approved by competent state agencies, and must ensure technical standards.

3. Toll stations, where tolls for vehicles operating on the roads are collected, shall be built according to plannings or investment projects approved by competent state agencies. Toll stations' operations must ensure uninterrupted and safe traffic.

4. Vehicle mass inspection stations, where road administration agencies collect information on, analyze and assess the impacts of vehicle mass and size limits on road safety; inspect and handle violations of vehicles with sizes and mass in excess of the permitted size limits of roads, and caterpillars traveling on roads, shall be built according to a master plan elaborated by the Ministry of Transport and approved by the Prime Minister.

In case of necessity to protect road infrastructure facilities, the Minister of Transport shall decide on setting up temporary vehicle mass inspection stations.

5. The Minister of Transport shall issue regulations on technical specifications of car terminals, parking lots, roadside service stations, toll stations and vehicle mass

inspection stations; and on the organization and operation of toll stations and vehicle mass inspection stations.

**Article 52. Protection of road infrastructure facilities**

1. Protection of road traffic infrastructure facilities covers ensuring safety and use life of road works and taking measures to prevent, stop and handle acts of illegally infringing upon road infrastructure facilities.

The protected area of road infrastructure facilities covers land areas of roads, road safety corridors, the space over and the subterranean and underwater spaces related to road work and traffic safety.

2. Organizations and individuals licensed to construct, renovate, expand and maintain works and carry out other activities within the protected area of road infrastructure facilities shall carry out these activities in accordance with law.

3. Road work administration units shall ensure works' technical safety and take joint responsibility for traffic accidents occurring due to the quality of works under their administration; if detecting that road works are damaged or at risk of endangering traffic, they shall promptly repair them, and take measures to prevent, combat and promptly remedy consequences caused to road works by natural disasters.

4. Road infrastructure facility protection responsibilities are defined as follows:

a/ The Ministry of Transport shall organize and guide the road infrastructure facility protection; examine and inspect the implementation of the law on road infrastructure facility administration and protection;

b/ The Ministry of Public Security shall direct and guide the police in examining and handling violations of the law on road infrastructure facility protection according to its competence;

c/ The People's Committees at all levels shall organize the protection of road infrastructure facilities in their localities; and protect road safety corridors in accordance with law;

d/ Ministries and ministerial-level agencies shall, within the scope of their respective tasks and powers, join in protecting road infrastructure facilities;

e/ The Government shall stipulate the coordination among ministries, ministerial-level agencies and People's Committees in protecting road infrastructure facilities.

5. Those who detect that road works are damaged or infringed upon or road safety corridors are illegally occupied shall promptly report such to the nearest People's Committees, road administration agencies or police offices for handling; in case of necessity, they shall take measures to notify road users thereof. Upon receiving reports, responsible agencies shall quickly take remedial measures to ensure uninterrupted and safe traffic.

**Chapter IV.**

**VEHICLES JOINING IN ROAD TRAFFIC**

**Article 53. Conditions for motor vehicles to join in road traffic**

1. Automobiles of proper types allowed to join in road traffic must satisfy the following quality, technical safety and environmental protection criteria:

a/ Being equipped with an effective brake system;

b/ Being fitted with an effective steering system;

c/ The steering wheel is on the left side of the automobile; for a foreigner's overseas-registered automobile with a right-handed steering wheel, to join in road traffic in Vietnam, it must comply with the Government's regulations;

- d/ Being fully equipped with driving and passing lamps, registration plate lamp, stop lamp and signal lamps;
- e/ Having the wheels fitted with pneumatic tires of the right size and right technical standards for each type of automobile;
- f/ Having sufficient rear-view mirrors and other equipment and devices to ensure the operator's visibility;
- g/ Having the windscreen and windows made of safety glass;
- h/ Having a horn of standard volume;
- i/ Being fully equipped with an exhaust silencer, an exhaust pipe and other equipment and devices to ensure exhaust gas and noise up to environmental standards;
- j/ Their structures are durable enough and ensure stable operation.

2. Motorcycles, three-wheeled motor vehicles and mopeds of right types allowed to join in road traffic must satisfy the quality, technical safety and environmental protection standards prescribed at Points a, b, d , e, f, h, i and j, Clause 1 of this Article.

3. Motor vehicles must have registration papers and number plates, granted by competent state bodies.

4. The Government shall stipulate the use life limits of motor vehicles.

5. The Minister of Transport shall prescribe quality, technical safety and environmental protection standards of motor vehicles permitted to join in road traffic, except for army and police motor vehicles used for defense and security purposes.

**Article 54.** Grant and withdrawal of registration papers and number plates of motor vehicles

1. Motor vehicles of lawful origin and satisfying the quality, technical safety and environmental protection standards under this Law will be granted registration papers and number plates by competent state agencies.

2. The Minister of Public Security shall stipulate and organize the grant of registration papers and number plates for motor vehicles of all kinds; the Minister of Defense shall stipulate and organize the grant of registration papers and number plates for army motor vehicles used for defense purposes.

**Article 55.** Assurance of quality, technical safety and environmental protection standards of motor vehicles joining in road traffic

1. The manufacture, assembly, modification, repair, maintenance and import of motor vehicles to join in road traffic must comply with regulations on quality, technical safety and environmental protection standards. It is strictly forbidden to transform automobiles of other types into passenger cars.

2. Owners of vehicles may not alter the structure, components or systems of their motor vehicles against the manufacturer designs or modification designs already approved by competent agencies.

3. Automobiles and trailers or semi-trailers pulled by automobiles joining in road traffic must be periodically inspected in terms of technical safety and environmental protection (below referred to as inspection).

4. The heads of register units and persons directly conducting inspection shall take responsibility for the confirmation of inspection results.

5. Vehicle owners and drivers shall maintain the technical status of their vehicles joining in road traffic according to the prescribed standards between two inspections.

6. The Minister of Transport shall stipulate conditions, standards for and grant of permits to motor vehicle register units; and stipulate and organize the inspection of motor vehicles. The Minister of Defense and the Minister of Public Security shall stipulate and organize the inspection of army and police motor vehicles used for defense and security purposes.

**Article 56.** Conditions for rudimentary vehicles to join in traffic

1. When joining in traffic, rudimentary vehicles of all kinds must satisfy the conditions on road traffic safety.
2. Provincial-level People's Committees shall specify the operation conditions and scope of rudimentary vehicles in their localities.

**Article 57.** Conditions for special-use vehicles to join in traffic

1. Satisfying the following quality, technical safety and environmental protection criteria:
  - a/ Having an effective brake system;
  - b/ Having an effective steering system;
  - c/ Having lamps;
  - d/ Ensuring the operator's visibility;
  - e/ Special-use parts must be fitted firmly at right positions, ensuring safety while traveling;
  - f/ Ensuring exhaust gas and noise according to environmental standards;
2. Having a registration paper and number plate granted by competent state agencies.
3. Operating within the prescribed area, ensuring safety for people, vehicles and road works while traveling.
4. The manufacture, assembly, modification, repair and import of special-use vehicles must comply with regulations on quality, technical safety and environmental protection.
5. The owners and operators of special-use vehicles shall maintain the technical safety conditions and have them inspected as prescribed for special-use vehicles in road traffic.
6. The Minister of Transport shall issue specific regulations on quality, technical safety and environmental protection, the grant and withdrawal of registration papers and number plates; determine a list of special-use vehicles subject to inspection and organize the inspection; the Minister of Defense and the Minister of Public Security shall stipulate and organize the grant and withdrawal of registration papers and number plates and the inspection of army and police special-use vehicles used for defense and security purposes.

## **Chapter V.**

### **OPERATORS OF VEHICLES JOINING IN ROAD TRAFFIC**

**Article 58.** Conditions for drivers of vehicles to join in traffic

1. Drivers of vehicles to join in traffic must be of the age and in good health as prescribed in Article 60 of this Law, and proper driver licenses for the types of vehicle they are permitted to operate, which are granted by competent state agencies. Learner drivers, when joining in traffic, shall practice driving on driving practice vehicles and have their driving supported by driving instructors.
2. When operating a vehicle, the driver shall carry the following papers:
  - a/ Vehicle registration paper;
  - b/ Driver license, for motor vehicle operators defined in Article 59 of this Law;

c/ Technical safety and environmental protection inspection certificate, for motor vehicles prescribed in Article 55 of this Law;

d/ Motor vehicle owner civil liability insurance certificate.

**Article 59. Driver licenses**

1. Depending on types, engine capacity, mass and utilities of motor vehicles, driver licenses are classified into driver licenses with unlimited validity and driver licenses with limited validity.

2. Driver licenses with unlimited validity are of the following categories:

a/ Category A1, granted to drivers of motorcycles with a cylinder capacity of between 50 cm<sup>3</sup> and under 175 cm<sup>3</sup>;

b/ Category A2, granted to drivers of motorcycles with a cylinder capacity of 175 cm<sup>3</sup> or higher and those prescribed for category-A1 driver licenses;

c/ Category A3, granted to drivers of three-wheeled motor vehicles and those prescribed for category-A1 driver licenses and similar vehicles.

3. Disabled people operating three-wheeled motor vehicles designed for them shall be granted category-A1 driver licenses.

4. Driver licenses with limited validity are of the following categories:

a/ Category A4, granted to drivers of tractors of a mass of up to 1,000 kg;

b/ Category B1, granted to non-professional drivers of passenger cars of up to 9 seats, trucks and tractors of a mass of under 3,500 kg;

c/ Category B2, granted to professional drivers of passenger cars of up to 9 seats, trucks and tractors of a mass of under 3,500 kg;

d/ Category C, granted to drivers of trucks and tractors of a mass of 3,500 kg or higher and vehicle types prescribed for category-B1 and -B2 driver licenses;

e/ Category D, granted to drivers of passenger cars of between 10 and 30 seats and vehicle types prescribed for category-B1, -B2 and -C driver licenses;

f/ Category E, granted to drivers of passenger cars of over 30 seats and vehicle types prescribed for category-B1, -B2, -C and -D driver licenses;

g/ Driver licenses of categories FB2, FD and FE, granted to drivers who already possess driver licenses of category B2, D or E to drive vehicles prescribed for these categories of driver licenses when pulling trailers or articulated passenger cars; driver licenses of category FC granted to drivers who already possess driver licenses of category C to drive vehicles prescribed for this category of driver license when pulling trailers or tractors pulling semi-trailers.

5. Driver licenses are valid nationwide and in the territories of countries or territories with which Vietnam has signed mutual driver license recognition commitments.

**Article 60. Age and health of drivers**

1. The driver age is prescribed as follows:

a/ Persons aged full 16 years or older may drive mopeds with a cylinder capacity of under 50 cm<sup>3</sup>;

b/ Persons aged full 18 years or older may drive motorcycles, three-wheeled motor vehicles with a cylinder capacity of 50 cm<sup>3</sup> or higher and vehicles with similar structure; trucks, tractors with a mass of under 3,500 kg; passenger cars of up to 9 seats;

c/ Persons aged full 21 years or older may drive trucks, tractors with a mass of 3,500 kg or more; category-B2 vehicles pulling trailers (FB2);

d/ Persons aged full 24 years or older may drive passenger cars of between 10 and 30 seats; category-C vehicles pulling trailers or semi-trailers (FC);

e/ Persons aged full 27 years or older may drive passenger cars of over 30 seats; category-D vehicles pulling trailers (FD);  
f/ The maximum age of drivers of 30 seat-plus passenger cars is 50 for women and 55 for men.

2. Drivers must be physically fit for the types and utilities of vehicles they drive. The Minister of Health shall assume the prime responsibility for, and coordinate with the Minister of Transport in, prescribing health standards for drivers, periodical health checks for automobile drivers, and medical establishments providing such health checks.

**Article 61. Driver training, examination to grant driver licenses**

1. Driver training establishments are categorized as job training establishments, must meet all adequate conditions on classrooms, driving practice grounds and vehicles, driving instructors, course books and teaching materials and possess a license as prescribed.

2. Driver training establishments must comply with the contents and programs prescribed for each kind and category of driver license.

3. Persons who wish to have driver licenses of categories A1, A2, A3, A4 and B1 must be trained. Persons who wish to have driver licenses of categories B2, C, D, E and driver licenses of category F must be trained on a full-time basis at training establishments.

4. Training for driver license upgrading shall be conducted for the following cases:

a/ Upgrading driver licenses from category B1 to B2;

b/ Upgrading driver licenses from category B2 to C or D;

c/ Upgrading driver licenses from category C to D or E;

d/ Upgrading driver licenses from category D to E;

e/ Upgrading driver licenses from category B2, C, D or E to categories of driver licenses for corresponding vehicles with trailers or semi-trailers.

5. Persons who wish to attend training for upgrading their driver licenses, in addition to satisfying the conditions prescribed in Clause 4 of this Article, must have a sufficient driving duration and a number of safe driving kilometers prescribed for each category of driver license; persons who wish to attend training for upgrading their driver licenses to category D or E must have at least completed lower secondary education.

6. The training of drivers of passenger cars of 10 seats or more and drivers of vehicles with trailers may only be conducted in the form of training for category upgrading under the conditions prescribed in Clauses 4 and 5 of this Article.

7. Examinations for the grant of driver licenses must be held at driver examination centers. Driver examination centers must be built according to planning, with material- technical foundations meeting the driver examination requirements as prescribed.

8. Driver examiners must possess an examiner card and shall take responsibility for the results of their examination.

9. Persons who have been trained and passed examinations shall be granted driver licenses of proper category.

For driver licenses with limited validity, before their expiration, drivers shall have health checks and carry out the presented procedures for renewal of their driver licenses.

10. The Minister of Transport shall specify the conditions and criteria for and grant permits to training establishments; prescribe the training forms, contents and programs; examine, grant and renew driver licenses; the Minister of Defense and the Minister of Public Security shall issue regulations on training establishments, organization of training, examinations, grant and renewal of driver license for army and police forces performing defense and security tasks.

**Article 62.** Conditions for operators of special-use vehicles joining in traffic

1. Operators of special-use vehicles joining in traffic must reach eligible age and physically fit for their occupations, and possess a certificate of training in road traffic law, a license or certificate for operating special-use vehicles, granted by a special-use vehicle operator training establishment.

2. Operators of special-use vehicles in traffic must carry the following papers:

a/ Vehicle registration paper;

b/ Certificate of training in road traffic law, a license or certificate for operating special-use vehicles;

c/ Technical safety and environmental protection inspection certificate, for special-use vehicles prescribed in Article 57 of this Law.

**Article 63.** Conditions on operators of rudimentary vehicles in traffic

1. Being physically fit for safe operation of vehicles.

2. Being knowledgeable about road traffic rules

## **Chapter VI.**

### **ROAD TRANSPORTATION**

#### **Section 1. ROAD TRANSPORTATION ACTIVITIES.**

**Article 64.** Road transportation activities

1. Road transportation activities include non-commercial road transportation and commercial road transportation. Commercial road transportation is a conditional business as presented by law.

2. Commercial road transportation includes commercial passenger transportation and commercial cargo transportation.

3. Road transportation activities must be in line with the road transportation planning and transportation route network.

**Article 65.** Working time of automobile drivers

1. In a day, an automobile driver must work for 10 hours at most and must not be on the wheel for more than 4 hours in a row.

2. Carriers and automobile drivers shall comply with Clause 1 of this Article.

**Article 66.** Commercial transportation by car

1. Commercial passenger transportation by car includes:

a/ Commercial passenger transportation along fixed routes with identified departure and destination stops according to given schedules and itineraries;

b/ Commercial passenger transportation by bus along fixed routes with specified stops for passenger embarkation and disembarkation, and buses traveling according to given itineraries with a specified distance and scope of operation;

c/ Commercial passenger transportation by taxi according to schedules and itineraries requested by passengers, and charges calculated according to taxi meters;

d/ Commercial passenger transportation under transportation contracts, without fixed routes;

e/ Tourist transportation according to tourist routes, programs and destinations.



2. Commercial cargo transportation by car includes:
  - a/ Ordinary commercial cargo transportation;
  - b/ Commercial cargo transportation by taxi truck;
  - c/ Commercial transportation of extra-long and extra-heavy cargoes;
  - d/ Commercial transportation of dangerous cargoes.
3. The Government shall issue specific regulations on commercial transportation by car.

**Article 67.** Conditions for commercial transportation by car

1. Enterprises, cooperatives and households conducting commercial transportation by car must fully meet the following conditions:
  - a/ Making registration for commercial transportation by car under law;
  - b/ Ensuring the quantity, quality and use life of vehicles suitable to the business form; fitting travel monitoring devices on their vehicles according to the Government's regulations;
  - c/ Ensuring the number of drivers and attendants suitable to the business plan and signing written labor contracts with them; attendants working on vehicles must be trained in transportation business skills and traffic safety; it is forbidden to employ drivers who are banned from driving under law;
  - d/ Persons who directly manage transportation activities of enterprises and cooperatives must possess transportation qualifications;
  - e/ Owning a parking lot suitable to the size of enterprise, cooperative or household, ensuring requirements of order, safety, fire and explosion prevention and fight, and environmental sanitation.
2. Only enterprises and cooperatives may conduct commercial passenger transportation along fixed routes, commercial passenger transportation by bus or by taxi, and must fully meet the following conditions:
  - a/ The conditions specified in Clause 1 of this Article;
  - b/ Having a section in charge of traffic safety conditions;
  - c/ Registering passenger transportation service quality standards with a competent agency and publicizing them.
3. Only enterprises and cooperatives may conduct commercial cargo transportation by container and must fully meet the conditions specified in Clause 1 and Point b, Clause 2, of this Article.
4. The Government shall issue specific regulations on conditions on and licensing of commercial transportation by car.

**Article 68.** Passenger transportation by car

1. Carriers and passenger car drivers shall comply with the following provisions:
  - a/ To embark and disembark passengers at prescribed places;
  - b/ Not to carry passengers on the car roofs or luggage compartments or let passengers cling to cars from the outside;
  - c/ Not to carry dangerous goods, fetid goods, animals or other goods adversely affecting passenger health;
  - d/ Not to carry passengers, luggage and cargo in excess of the prescribed mass or passenger number;
  - e/ Not to load cargo in passenger cabins; to take measures to keep the cars clean.
2. The Minister of Transport shall prescribe the organization and management of passenger transportation by car.

**Article 69.** Rights and obligations of passenger transportation dealers

1. The passenger transportation dealer has the following rights:
  - a/ To collect transportation fares and freights;
  - b/ To refuse to transport before the vehicles leave the car terminal or embarking positions or to disembark under transport contracts persons who possess tickets or are named in the contracts but commit acts of disturbing public order, obstructing the transport dealer's work, affecting the health and property of others or cheating in tickets, or passengers suffering a dangerous disease.
2. The passenger transportation dealer has the following obligations:
  - a/ To fully realize the commitments on transport quality or fully perform transport contracts;
  - b/ To buy insurance for passengers, with insurance premiums included in passenger tickets;
  - c/ To hand tickets and freight receipts to passengers;
  - d/ To pay compensation for damage caused by their employees or representatives when performing jobs assigned by them;
  - e/ To take responsibility for consequences caused by their employees or representatives in complying with their requests in contravention of this Law.
3. The Minister of Finance shall assume the prime responsibility for, and coordinate with the Minister of Transport in, prescribing passenger tickets and freight receipts.

**Article 70.** Responsibilities of drivers and attendants working on passenger cars

1. To check their cars' safety conditions before setting off.
2. To show civilized and polite behaviors and guide passengers to their right seats.
3. To check the arrangement and tie up luggage and cargo to ensure safety.
4. To take measures to protect passengers' lives, health and property, and maintain order and sanitation in their cars;
5. To close the doors before and during the time the cars move.

**Article 71.** Rights and obligations of passengers

1. Passengers have the following rights:
  - a/ To be transported according to the transport contracts and transport dealer's transport quality commitments;
  - b/ To pay no freight for luggage not exceeding 20 kg and of a size suitable to the car's design;
  - c/ To refuse transport before the car sets off and be refunded ticket money according to regulations of the Minister of Transport.
2. Passengers have the following obligations:
  - a/ To buy tickets and pay freights for carried luggage in excess of the prescribed limit;
  - b/ To be present at the places of departure on time as agreed upon; to observe transport regulations; to comply with the instructions of the driver and attendants to ensure traffic order and safety;
  - c/ Not to carry luggage and goods banned by law from circulation.

**Article 72.** Cargo transportation by car

1. The transportation of goods by car must comply with the following provisions:
  - a/ Cargoes transported on cars must be tidily arranged and securely tied up;
  - b/ When transporting unpackaged cargo, to cover them and not to let them drop on the road.
2. The following acts are prohibited:

- a/ Transporting cargoes beyond the designed mass or beyond the size limits permitted for the car;
- b/ Carrying people in a car's body, except for the case specified in Clause 1, Article 21 of this Law.

3. The Minister of Transport shall prescribe the organization and management of cargo transport by car.

**Article 73.** Rights and obligations of cargo transportation dealers

1. The cargo transportation dealer has the following rights:

- a/ To request the transportation charterer to supply necessary information on the cargo for writing in transportation papers and examine the accuracy of such information;
- b/ To request the transportation charterer to fully pay freights and arising expenses; to request the transportation charterer to pay compensations for damage caused by breaches of contract;
- c/ To refuse transportation if the transportation charterer fails to deliver cargoes as agreed upon in their contract;
- d/ To request cargo survey when necessary.

2. The cargo transportation dealer has the following obligations:

- a/ To provide vehicles of proper type, at the time and place and deliver cargo to consignees as agreed upon in contracts;
- b/ To guide the loading and unloading of cargo on vehicles;
- c/ To pay compensation to the transportation charterer for cargo losses or damage in the course of transportation from the receipt to delivery of cargo, except for cases of exemption as prescribed by law;
- d/ To pay compensation for damage caused by his/her employees or representatives when performing jobs assigned by him/her;
- e/ To take responsibility for consequences caused by his/her employees or representatives in complying with his/her requests in contravention of this Law.

3. The Government shall prescribe liability limits of cargo transportation dealers.

**Article 74.** Rights and obligations of cargo transportation charterers

1. The cargo transportation charterer has the following rights:

- a/ To refuse to load cargo on a vehicle which is not of a type as agreed upon in the contract;
- b/ To request the transportation dealer to deliver cargo at the time and place as agreed upon in the contract;
- c/ To request the transportation dealer to pay compensation for damage according to law.

2. The cargo transportation charterer has the following obligations:

- a/ To prepare adequate lawful papers on the cargo before delivering it to the transportation dealer; to package the cargo according to specifications with sufficient and clear signals and codes; to deliver cargo to the transportation dealer at the time and place according to other instructions stated in the cargo delivery document;
- b/ To fully pay freights and arising expenses for the cargo transportation dealer;
- c/ To appoint persons to escort the cargo in the course of transportation, for cargo requiring escorts.

**Article 75.** Rights and obligations of cargo consignees

1. The cargo consignee has the following rights:

- a/ To receive and check the received cargo against the transport paper or equivalent document;
- b/ To request the transportation dealer to pay expenses for late delivery;
- c/ To request or notify the transportation charterer to request the transportation dealer to pay compensations for cargo damage or loss;
- d/ To request cargo survey when necessary.

2. The cargo consignee has the following obligations:

- a/ To receive the cargo at the time and place as agreed upon; to produce the transport paper and personal identity paper to the transport dealer before receiving the cargo;
- b/ To pay expenses for late cargo receipt.

**Article 76.** Transportation of extra-long and extra-heavy cargo

1. Extra-long or extra-heavy cargo means goods of a size or weight exceeding the prescribed limits but impossible to disassemble.
2. Extra-long or extra-heavy cargo must be transported on trucks suitable to such type of cargo and require a road use permit granted by a competent state agency.
3. Extra-long or extra-heavy cargo-transporting trucks must travel at a speed prescribed in their permits and have signals on the size of the cargo; when necessary, persons conducting traffic must be deployed to ensure traffic safety.
4. The Minister of Transport shall issue specific regulations on the transportation of extra-long and extra-heavy cargo.

**Article 77.** Transportation of live animals

1. Depending on species of live animals, the transportation dealer may request the transportation charterer to arrange an escort to take care of these animals in the course of transportation
2. The transportation charterer is responsible for loading and unloading live animals under the guidance of the transportation dealer; if unable to do so; the transportation charterer shall pay freights and loading and unloading charges to the transportation dealer.
3. The transportation of live animals on roads must observe the laws on hygiene, epidemic prevention and environmental protection.

**Article 78.** Transmutation of dangerous cargo

1. Cars carrying dangerous cargo must acquire permits granted by competent state agencies.
2. Cars carrying dangerous cargo may not stand and park at crowded places or danger-prone places.
3. The Government shall prescribe a list of dangerous cargo, the transportation of dangerous cargo and the competence to grant permits for transportation of dangerous cargo.

**Article 79.** Road transportation in urban areas

1. Buses must operate along prescribed routes, according to prescribed schedules and stand and park at prescribed places.
2. Drivers of passenger taxis or cargo taxis may embark and disembark passengers or load and unload cargo as agreed upon with passengers or cargo owners but shall comply with regulations on traffic safety.
3. Cargo trucks must operate along prescribed routes, within areas and according to schedules prescribed for each type of truck.

4. Rubbish vans and trucks carrying scraps or loose materials must be covered in order to prevent them from dropping on streets; if letting them drop, the carrier shall promptly clean up the streets.

5. Provincial-level People's Committees shall issue specific regulations on road transportation in urban areas and the proportion of mass transit vehicles to meet the travel need of disabled persons.

**Article 80.** Passenger and cargo transportation by rudimentary vehicles, mopeds, motorcycles, three-wheeled motor vehicles and the like

1. The use of rudimentary vehicles, mopeds, motorcycles, three-wheeled motor vehicles and the like for carrying passengers and cargo must comply with regulations on traffic order and safety.

2. The Minister of Transport shall prescribe the implementation of Clause 1 of this Article.

3. Basing themselves on regulations of the Minister of Transport, provincial-level People's Committees shall detail the implementation thereof in localities.

**Article 81.** Multi-modal transportation

1. Multi-modal transportation referred to in this Law means transportation of cargo from the place of receipt to the place of delivery of cargoes to a consignee by at least two modes, including the mode of road transportation, on the basis of a multi-modal transportation contract.

2. The Government shall issue specific regulations on multi-modal transportation.

## **Section 2. ROAD TRANSPORTATION SUPPORT SERVICES**

**Article 82.** Road transportation support services

1. Road transportation support services include services at car terminals; parking lots and roadside service stations, and transportation agency, ticket sale agency, cargo collection, transshipment, warehousing and road transportation rescue services.

2. The Minister of Transport shall issue specific regulations on road transportation support services.

**Article 83.** Organization of operation of car terminals, parking lots and roadside service stations

1. The operation of passenger car terminals, cargo truck terminals, parking lots and roadside service stations must ensure order, safety, environmental sanitation, and fire and explosion prevention and fighting and submit to the management of local state management agencies.

2. Enterprises and cooperatives operating passenger car terminals have the right and obligation to arrange ticket sale offices or organize the sale of tickets to passengers under contracts with transport dealers; arrange cars fully meeting transportation business conditions to enter the terminals to take and discharge passengers according to proper routes.

3. Enterprises and cooperatives operating cargo truck terminals have the right and obligation to arrange trucks to enter the terminals to load and unload cargoes and cargo warehousing, consignment, packaging and preservation services.

4. Enterprises and cooperatives operating parking lots have the right and obligation to organize vehicle watch services.

5. Enterprises and cooperatives operating roadside service stations have the right and obligation to organize services for road users and vehicles in road traffic; and to perform jobs under service contracts with carriers.

6. Provincial-level People's Committees shall prescribe car terminal service charges based on the types of car terminals.

## **Chapter VII.**

### **STATE MANAGEMENT OF ROAD TRAFFIC**

**Article 84.** Contents of state management of road traffic

1. Formulating plannings, plans and policies on road transport development; drawing up and directing the implementation of the national program on road traffic safety.
2. Promulgating, and organizing the implementation of, legal documents on road traffic; regulations and standards for road traffic.
3. Propagating, disseminating and educating about the road traffic law.
4. Organizing the administration, maintenance and protection of road infrastructure facilities.
5. Registering, granting and withdrawing number plates of, road traffic means; granting, withdrawing certificates of quality, technical safety and environmental protection of road vehicles.
6. Managing driver training and examination; granting, renewing and withdrawing driver licenses and certificates of training in knowledge about the road traffic law.
7. Managing transportation activities and transportation support services; organizing road traffic rescue.
8. Organizing research and application of road traffic science and technologies; training road traffic technicians and technical workers.
9. Examining, inspecting, and settling complaints and denunciations; handling violations of the road traffic law.
10. Undertaking international cooperation in road traffic.

**Article 85.** State management responsibilities for road traffic

1. The Government shall perform the unified state management of road traffic.
2. The Ministry of Transport shall take responsibility to the Government for performing the state management of road traffic.
3. The Ministry of Public Security shall perform the tasks of state management of road traffic under this Law and other relevant laws; take measures to ensure traffic order and safety; and coordinate with the Ministry of Transport in protecting road infrastructure facilities.

The Ministry of Public Security and the Ministry of Transport shall coordinate with each other in supplying data on registration of road vehicles, data on traffic accidents and in granting, renewing and withdrawing driver licenses.

4. The Ministry of Defense shall perform the tasks of state management of road traffic under this Law and other relevant laws.
5. Ministries, ministerial-level agencies and government-attached agencies shall, within the scope of their tasks and powers, coordinate with the Ministry of Transport in performing the state management of road traffic.
6. The People's Committees at all levels shall, within the scope of their tasks and powers, organize the state management of road traffic under this Law and other relevant laws on localities.

**Article 86.** Road inspectorate

1. The road inspectorate shall perform specialized inspection of road traffic.
2. The road inspectorate has the following tasks and powers:
  - a/ To inspect, detect, stop and sanction administrative violations in the observance of legal provisions on protection of road infrastructure, assurance of technical standards

of road works; in urgent cases, in order to prevent possible consequences on road works, to stop vehicles and ask their operators to take measures to protect works in accordance with law and take responsibility for such decisions;

b/ To inspect, detect, stop and handle administrative violations in the observance of regulations on transportation activities and transportation support services at standing and parking points along roads, car terminals, parking lots, roadside service stations, vehicle mass inspection stations, toll stations and at road transportation enterprises;

c/ To inspect, detect, stop and sanction violations in driver training and examination, the grant, renewal and withdrawal of driver licenses, and the technical safety and environmental protection inspection of motor vehicles. The inspection and examination of army and police car drivers, and the grant, renewal and withdrawal of their driver licenses shall be stipulated by the Minister of Defense and the Minister of Public Security;

d/ To perform other tasks and exercise other powers according to the inspection law.

3. The organization and operation of the road traffic inspectorate comply with this Law and other relevant laws.

The Minister of Transport shall issue specific regulations on the tasks and powers of the road inspectorate.

**Article 87.** Patrol and control of road traffic police

1. The road traffic police shall patrol and control road users and vehicles in traffic; handle their violations of road traffic law and take responsibility before law for their decisions; coordinate with the road administration agency in detecting and stopping acts of violating regulations on protection of road works and road safety corridors.

2. The Minister of Public Security shall issue specific regulations on tasks, powers, forms and contents of patrol and control by road traffic police.

3. The Government shall stipulate the mobilization of other police forces and commune police to join the road traffic police in patrolling and controlling road traffic order and safety in necessary cases.

### **Chapter VIII.**

### **IMPLEMENTATION PROVISIONS**

**Article 88.** Effect

1. This Law takes effect on July 1, 2009.

2. This Law replaces the June 29, 2001 Law on Road Traffic.

**Article 89.** Implementation detailing and guidance

The Government and competent agencies shall detail and guide the implementation of articles and clauses of this Law as assigned; and guide other necessary provisions of this Law to meet state management requirements.

*This Law was passed on November 13, 2008, by the XIIth National Assembly of the Socialist Republic of Vietnam at its 4th session.*

**CHAIRMAN OF THE NATIONAL ASSEMBLY**

**Nguyen Phu Trong**

**3.2 No.1734/QĐ-TTg (DECISION): The Vietnam Expressway Network Development Master Plan toward 2020 and a vision beyond 2020**



PRIME MINISTER

SOCIALIST REPUBLIC OF VIETNAM  
Independence – Freedom – Happiness

No.1734/QĐ-TTg

*Hanoi, December 01, 2008*

## DECISION

Approving the Vietnam Expressway Network Development Master Plan toward 2020 and a vision beyond 2020

-----

PRIME MINISTER

Pursuant to Law on Organization of the Government dated Dec 25, 2001

At the proposal of the Ministry of Transportation (Letter of Transmittal No. 7056/TTr-BGTVT dated 05/11/2007 on the Vietnam Expressway Network Development Master Plan toward 2020 and a vision beyond 2020)

## DECIDES

Article 1. To approve the Vietnam Expressway Network Development Master Plan toward 2010 and a vision beyond 2020 with the main contents as follows:

### 1. Viewpoint:

The national expressway network is to be constructed completely, appropriately and adaptationally to the requirements for the long-term development of the country in need of industrializing the country in 2020. The expressway network includes trunk lines with traffic volume, connecting with the road system, other transportation infrastructures to simultaneously, actively and effectively operate the transportation services in the economic development. The master plan is the basis to determine the investment fund, land fund and implementation schedule of expressway projects from now up to 2020 and the following years:

### 2. Goals

- To promptly build up the national expressway network that ensures a connectivity to focal economic zones, main border gates and significant transport hubs where exist high traffic volume. In that network, the South - North expressway project should be a focus of interest with priorities given to sections connecting to large cities (such as Hanoi, HCMC, Danang) and to the large seaports.
- The expressway network should be able to link with other modern modes of transport and enhance the regional and international integration.
- The expressway is a separate project; however, it will be required to integrate with the existing road network and protect the environment, landscape.
- The expressway network will contribute to handle traffic congestion, particularly in Hanoi and Ho Chi Minh City.
- In the master plan, the expressways are planned in a completed scale; however, the construction of these routes can be implemented by phases in reference to traffic volume

and fund availability. On the hand, it is needed to manage the land fund to reduce land acquisition costs in the future.

### **3. Vietnam Expressway Network Development Master Plan**

Based on the forecast demand, the socio-economic development orientation for 2020; the economic development orientation of three focal economic zones; the transport development strategy up to 2020 and vision beyond 2020; the master plan defines the expressway network of Vietnam to include 22 expressways with the total length of 5,873km.

#### **a) The North- South Expressway**

Including 02 routes and the total length is 3.262km

- The earthen North- South Expressway: 1.941km length
- The western North- South Expressway: 1.321km length

#### **b) The expressway system in the northern region**

Including 07 routes connecting with Hanoi Capital; total length of 1.099km, specify:

- Lang Son- Bac Giang- Bac Ninh, 130km in length;
- Ha Noi- Hai Phong, 105km;
- Ha Noi- Viet Tri- Lao Cai, 264km;
- Noi Bai- Ha Long- Mong Cai, 294km;
- Ha Noi- Thai Nguyen- Cho Moi (Bac Kan), 90km;
- Lang- Hoa Lac- Hoa Binh, 56km in length;
- Ninh Binh- Hai Phong- Quang Ninh, 160 km;

#### **c) The expressway system in the Central region and Central Highland**

Including 03 routes with the total length of 264km, specify:

- Hong Linh (Ha Tinh)- Huong Son (Ha Tinh), 34km;
- Cam Lo (Quang Tri)- Lao Bao (Quang Tri), 70km;
- Quy Nhon (Binh Dinh)- Pleiku (Gia Lai), 160km.

#### **d) The expressway system in the Southern region**

Including 07 routes with the total length of 984km, specify:

- Bien Hoa (Dong Nai)- Vung Tau (Ba Ria- Vung Tau), 76km;
- Dau Giay (Dong Nai)- Da Lat (Lam Dong), 209km;
- Ho Chi Minh City- Thu Dau Mot (Binh Duong)- Chon Thanh (Binh Phuoc), 69km;
- Ho Chi Minh City- Moc Bai (Tay Ninh), 55km;
- Chau Doc (An Giang)- Can Tho- Soc Trang, 200km;
- Ha Tien- Rach Gia (Kien Giang)- Bac Lieu, 225km;
- Can Tho- Ca Mau, 150km.

#### **e) Ring-road expressway system in Hanoi and HCMC**

In Ha Noi City:

- Ring Road 3: 56km;

- Ring Road 4: 125km;

Ho Chi Minh City:

- Ring Road 3: 83km.

(Ring Road 5 (Hanoi City) and Ring Road 4 (HCMC) function to connect urban satellites will be considered and revised during the implementation).

#### **4. List, scope and construction schedule of expressways**

The List, scope, total estimated investment and construction schedule are shown in the Appendix I.

#### **5. Proposed land fund:**

The total land fund for the planned expressways is about 41.104ha, in which, occupied area of completed and under-constructed expressways is about 2.916ha, additional area is required to be 38.188ha (in which, the area of agricultural land is estimated at about 24.167ha).

Please refer to the Appendix II for detail information of occupied land by route and locality

#### **6. Mechanism and Policy:**

##### a) Mechanism for Fund Creation

The fund for the construction of expressway network will be mobilized from the following sources:

- The state budget under the forms of Government loan or Loan Security and construction bond ...;
- Funds mobilized by the investors under the forms of BOT, BTO, BT, Public-Private Partnership (PPP)...

Ministry of Transportation will oversee and coordinate with Ministry of Planning and Investment, Ministry of Finance to formulate a mechanism for fund creation to construct the expressway network toward motivating involvement of domestic and foreign economic bodies.

##### b) Application of Advance Sciences and Technologies

It is recommended to adopt new technologies, new materials in expressway construction. Applying advanced technologies in Managing- Building- Operating: traffic safety facilities, Information Technology in Operation and Management.

##### c) Organizing the management

Ministry of Transportation is the state agency of expressway construction, investment, management and operation in the nationwide.

##### d) Formulation of integrated policies for implementing the master plan

- To formulate a policy that creates a fair play ground for the investors and a policy of environment protection in the expressway development.
- To formulate a policy of human resource development: Extending methods for domestic and oversea training on expressway construction, management and operation.

#### **Article 2. Organizing the implementation**

##### 1. Ministry of transportation:

To be responsible for monitoring and implementing the master plan;

The Ministry of Transport needs study on an appropriate organizational model for management of expressway investment, construction and operation; build up Vietnam

Expressway Cooperation (VEC) as the core enterprise in expressway investment and development of Vietnam.

2. Relevant Ministries and Agencies:

Subject to their function, responsibility, power, the relevant agencies have responsibility to cooperate with MOT, People Committees of Provinces, cities to realize the goals, ensuring a consistence and integration with the implementation of the Socio-Economic Development Plan of Vietnam toward 2020 and vision beyond 2020, the sectoral socio-economic development plans and the provincial socio-economic development plans..

3. Relevant People Committees of Provinces and Cities:

- To cooperate with MOT and Relevant Ministries, Agencies to organize the construction of expressways;
- To review and adjust the existing plans and projects in the provinces/ cities in order to match with this master plan;
- To approve, decide to change the purpose of land-use into expressway construction under the Land Law; strengthen the management of land fund for implementing the master plan.

Article 3. This decision take effects 15 days after the date of signing Ministers, Leaders of Ministerial- level agencies, Leaders of Government Agencies, Chairmen of People committees of relevant provinces, cities shall take responsibilities to enforce this decision./.

PRIME MINISTER  
(signed and sealed)

Nguyen Tan Dung

**Appendix I**  
**List of national road and expressway to 2020 and vision over 2020**  
(Issued with Decision 1734/QĐ-TTg on December 1<sup>st</sup>, 2008 of Prime Minister)

No	Road Routes/Sections	Starting point	Ending point	Length (km)	Scale (Lane)	Estimate Total investment (billions vnd)	Estimate total investment (millions usd) 1 usd= 20,000vnd	Investment progress
<b>North – south expressway East side</b>								
1	Gie Bridge – Ninh Binh	Gie Bridge – Ha Tay	Ninh Binh province	50	6	9,300	465	Under construction, phase I: 4 lanes
2	Ninh Binh – Thanh Hoa	Ninh Binh Province	Quang Xuong district, Thanh hoa	75	6	12,380	619	Before 2020
3	Thanh Hoa – Vinh	Thanh Hoa	Ben Thuy bridge, Vinh city	140	6	22,120	1,106	Before 2020
4	Vinh – Ha Tinh	Vinh	Hong Linh Town	20	4-6	2,580	129	Before 2020
5	Ha Tinh – Quang Tri	Bai Voi interchange	Cam Lo – Quang Tri	277	4	21,610	1,080.5	
6	Quang Tri – Da Nang	Cam Lo – Quang Tri	Tuy Loan – Da Nang	178	4	18,160	908	Before 2020
7	Da Nang – Quang Ngai	Da Nang city	Quang Ngai town	131	4	17,820	891	Before 2020
8	Quang Ngai – Quy Nhon	Quang Ngai Town	An Nhon – Binh Dinh	150	4	23,700	1,185	Before 2020
9	Quy Nhon – Nha Trang	An Nhon, Binh Dinh	Nha trang city	240	4	24,960	1,248	
10	Nha Trang – Dau Giay	Nha Trang city	Dau Giay – Dong Nai	378	4 – 6	55,940	2,797	

No	Road Routes/Sections	Starting point	Ending point	Length (km)	Scale (Lane)	Estimate Total investment (billions vnd)	Estimate total investment (millions usd) 1 usd= 20,000vnd	Investment progress
11	Ho Chi Minh city – Long Thanh – Dau giay	Ho Chi Minh city	Dau Giay, Dong Nai	55	6 – 8	18,880	944	Before 2020
12	Long Thanh – Nhon – Luc port	Long Thanh, Dong Nai	Ben Luc, Long An	45	6 – 8	12,340	617	Before 2020
13	Ho Chi Minh city – Trung Luong	Dem market, Ho Chi Minh city	Trung Luong	40	8	13,200	660	Under Construction, Phase 1: 4 lanes
14	Trung Luong – My Thuan – Can Tho	Ho Chi Minh city	Can Tho	92	6	26,250	1,312.5	Before 2020
	North – South expressway West side							
15	Doan Hung – Hoa Lac – Phu Chau	Doan Hung, Phu Tho	Pho Chau, Ha Tinh	457	4 – 6	53,930	2,696.5	
16	Ngoc Hoi – Chon Thanh – Rach Gia	Ngoc Hoi, Kon Tum	Rach Gia Town, Kien Gian	864	4 – 6	96,770	4,838.5	
	<b>North Region</b>							
1	Lang Son – Bac Giang – Bac Ninh	Huu Nghi Border crossing	Nhu Cau Bridge, national highway 1A, Bac Ninh	130	4 – 6	12,220	611	Before 2020
2	Ha Noi – Hai Phong	Ha Noi	Hai Phong	105	4 – 6	16,800	840	Before 2020
3	Ha Noi – Lao Cai	Noi Bai, Ha Noi	Lao Cai City	264	4 – 6	15,580	779	Before 2020
4	Ha Noi – Thai Nguyen	Ha Noi	Thai Nguyen city	62	4 – 6	4,220	211	Before 2020
5	Thai Nguyen – Moi market	Thai Nguyen city	Moi market	28	4 – 6	2,940	147	
6	Lang – Hoa Lac	Lang	Hoa Lac	30	6	7,650	382.5	Under construction

No	Road Routes/Sections	Starting point	Ending point	Length (km)	Scale (Lane)	Estimate Total investment (billions vnd)	Estimate total investment (millions usd) 1 usd= 20,000vnd	Investment progress
7	Hoa Lac – Hoa Binh	Hoa Lac Interchange	Hoa Binh city	26	4 – 6	2,550	127.5	
8	Bac Ninh – Ha Long	Bac Ninh city	Ha Long city	136	6	19,040	952	Before 2020
9	Ha Long – Mong cai	Ha Long city	Mong Cai town	128	4 – 6	13,820	691	Before 2020
10	Ninh Binh – Hai Phong – Quang Binh	Ninh Binh province	Ha Long	160	4	13,760	688	
	<b>Central region</b>							
1	Hong Linh – Huong Son	Hong Linh town	Huong Son town	34	4	2,450	122.5	
2	Cam Lo – Lao Bao	Cam Lo Town, Quang Tri	Lao Bao Border crossing	70	4	4,900	245	
3	Quy Nhon – PleiKu	An Nhon, Binh Dinh	PleiKu city	160	4	12,000	600	
	<b>South region</b>							
1	Dau Giay – Da Lat	Dau Giay	Da Lat city	189	4	19,280	964	Before 2020
2	Bien Hoa – Vung Tau	Bien Hoa city	Vung Tau city	76	6	12,160	608	Before 2020
3	Ho Chi Minh – Thu Dau Mot – Chon Thanh	Binh Phuoc interchange	Chon Thanh	69	6 – 8	20,010	1000.5	
4	Ho Chi Minh city – Moc Bai	Ring road No.3 Ho Chi Minh city	Moc Bai border crossing	55	4 – 6	7,480	374	
5	Soc Trang – Can Tho – Chau Doc	Soc Trang province	Chau Doc Town	200	4	24,200	1,210	
6	Ha Tien – Rach Gia – Bac Lieu	Xa Xia Border crossing, Ha Tien town	Bac Lieu Town	225	4	27,230	1,361.5	
7	Can Tho – Ca Mau	Can Tho town	Ca Mau city	150	4	24,750	1,237.5	
	<b>Hanoi ring road system</b>							

No	Road Routes/Sections	Starting point	Ending point	Length (km)	Scale (Lane)	Estimate Total investment (billions vnd)	Estimate total investment (millions usd) 1 usd= 20,000vnd	Investment progress
1	Ring road No 3	Noi Bai, Ha noi	Same as starting point	56	4 – 6	17,990	899.5	Before 2020
2	Ring road No 4	Soc Son, Ha Noi	Same as starting point	125	6 – 8	34,500	1,725	
<b>Ho Chi Minh Ring road system</b>								
1	Ring road No3	Nhon Trach, Dong Nai	Binh Chanh, Ho Chi Minh city	83	6 – 8	20,750	1,037.5	Before 2020
<b>Total</b>				<b>5,753</b>		<b>766,220</b>	<b>38,311</b>	

Note: The table above excluded sections such as Bac Ninh – Phap Van (40km), Phap Van – Gie Bridge (30km), Noi Bai – Bac Ninh (30km), Lien Khuong – Da Lat (20km).



**Appendix II**  
**SUMMARY TABLE OF OCCUPIED LAND AREA IN PLAN**

(Issued with the Decision 1734/QĐ-TTg  
on January 12<sup>th</sup>, 2008 of the Prime Minister)

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
<b>I</b>	<b>Red River Delta</b>						
1	Ha Noi	North – South, East side	166,80	0,00	457,20	2.620,49	2.620,49
		Ha Noi – Hai Phong		68,03			
		Noi Bai – Ha Long – Mong Cai	64,00	11,20			
		Ha Noi – Thai Nguyen		129,60			
		Ha Noi – Viet Tri – Lao Cai		177,16			
		Lang – Hoa Lac – Hoa Binh	107,00				
		Ring Road 3, Ha Noi	119,40	134,50			
		Ring road 4, Ha Noi		2.100,00			
2	Vinh Phuc	Ring road 4, Ha Noi		1.300,00	0,00	1.618,88	1.618,88
		Ha Noi – Viet Tri – Lao Cai		318,88			
3	Bac Ninh	North – South, East side	122,40		190,40	1.776,90	1.776,90
		Noi Bai – Ha Long – Mong Cai	68,00	152,90			
		Ring road 4, Ha Noi		1.600,00			
		Ha Noi – Thai Nguyen		24,00			

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
4	Ha Tay	North – South, East side	92,40	25,50	513,71	4.568,50	4.568,50
		North – South, West side	53,31	143,00			
		Ring road 4, Ha Noi		4.400,00			
		Lang – Hoa Lac – Hoa Binh	368,00				
5	Hai Duong	Ha Noi – Hai Phong		434,82	0,00	528,82	528,82
		Noi Bai – Ha Long – Mong Cai		94,00			
6	Hai Phong	Ha Noi – Hai Phong		309,86	0,00	569,32	569,32
		Ninh Binh – Hai Phong – Quang Ninh		259,46			
7	Hung Yen	Ring road 4, Ha Noi		1.800,00	0,00	2.028,16	2.028,16
		Ha Noi, Hai Phong		228,16			
8	Thai Binh	Ninh Binh – Hai Phong – Quang Ninh		194,59	0,00	194,59	194,59
9	Ha Nam	North – South, East side		122,40	0,00	122,40	122,40
10	Nam Dinh	North – South, East side		102,00	0,00	274,97	274,97
		Ninh Binh – Hai Phong – Quang Ninh		192,97			
11	Ninh Binh	North – South, East side		93,30	0,00	201,41	201,41
		Ninh Binh – Hai Phong – Quang Ninh		108,11			
<b>II</b>	<b>Northeast</b>						
12	Bac Kan	Thai Nguyen – Cho Moi		33,60		33,60	8,40

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
13	Lao Cai	Ha Noi – Viet Tri – Lao Cai		399,22	0,00	399,22	119,77
14	Yen Bai	Ha Noi – Viet Tri – Lao Cai		463,84	0,00	463,84	139,15
15	Thai Nguyen	Ha Noi – Thai Nguyen		114,00	0,00	198,00	66,60
		Thai Nguyen – Cho Moi		84,00			
16	Lang Son	North – South, East side	144,97	346,85	144,97	346,85	138,74
17	Quang Ninh	Noi Bai – Ha Long – Mong Cai		1.077,80	0,00	1.142,66	349,29
		Ninh Binh – Hai Phong – Quang Ninh		64,86			
18	Bac Giang	Ring road 4, Ha Noi		1.300,00	64,40	1.439,61	705,84
		North – South, East side	64,40	139,61			
19	Phu Tho	Ha Noi – Viet Tri – Lao Cai		228,90	49,92	328,75	164,37
		North – South, West side	49,92	99,85			
<b>III</b>	<b>Northwest</b>						
20	Hoa Binh	North – South, West side	80,85	242,54	95,93	589,33	176,80
		Lang – Hoa Lac – Hoa Binh	15,08	346,79			
<b>IV</b>	<b>North of Central Area</b>						
21	Thanh Hoa	North – South, East side		605,00	168,01	1,109,02	514,21
		North – South, West side	168,01	504,02			
22	Nghe An	North – South, East side		506,00	166,74	908,96	333,59
		North – South, West side	166,74	402,96			

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
23	Ha Tinh	North – South, East side		588,50	7,58	780,46	273,79
		North – South, West side	7,58	15,16			
		Hong Linh – Huong Son		176,80			
24	Quang Binh	North – South, East side		637,00	0,00	637,00	127,40
25	Quang Tri	North – South, East side		332,00	0,00	682,00	136,40
		Cam Lo – Lao Bao		350,00			
26	Thua Thien Hue	North – South, East side		360,00	0,00	360,00	108,00
<b>V</b>	<b>South Central Coast</b>						
27	Da Nang	North – South, East side	29,74	217,88	29,74	217,88	65,36
28	Quang Nam	North – South, East side		386,40	0,00	386,40	115,92
29	Quang Ngai	North – South, East side		469,20	0,00	469,20	140,76
30	Binh Dinh	North – South, East side		583,30	0,00	8113,30	220,99
		Quy Nhon - Pleiku		230,00			
31	Phu Yen	North – South, East side		510,00	0,00	510,00	102,00
32	Khanh Hoa	North – South, East side		892,50	0,00	892,50	178,50
<b>VI</b>	<b>Highland</b>						
33	Kon Tum	North – South, West side	37,90	113,69	37,90	113,69	11,37
34	Gia Lai	North – South, West side	156,64	469,91	156,64	1,019,91	101,99
		Quy Nhon - Pleiku		550,00			
35	Dak Lak	North – South, West side	138,95	416,86	138,95	416,86	41,69

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
36	Dak Nong	North – South, West side	123,79	371,38	123,79	371,38	37,14
37	Lam Dong	Dau Giay – Da Lat	100,00	475,00	100,00	475,00	47,50
<b>VII</b>	<b>South East Area</b>						
38	Ninh Thuan	North – South, East side		316,20	0,00	316,20	63,24
39	Binh Thuan	North – South, East side		984,30	0,00	984,30	295,29
40	Binh Phuoc	North – South, West side	198,32	612,04	198,32	946,84	222,85
		Ho Chi Minh city - Thu Dau Mot – Chon Thanh		334,80			
41	Tay Ninh	North – South, West side		65,83	0,00	192,73	35,25
		Ho Chi Minh city – Moc Bai		126,90			
42	Binh Duong	North – South, West side		151,15	0,00	188,95	34,01
		Ho Chi Minh city - Thu Dau Mot – Chon Thanh		37,80			
43	Dong Nai	North – South, East side		550,80	0,00	1,220,10	248,91
		Ho Chi Minh city – Long Thanh – Dau Giay		35,70			
		Bien Hoa – Vung Tau		220,00			
		Dau Giay – Da Lat		413,60			
44	Ba Ria – Vung Tau	Bien Hoa – Vung Tau		198,00	0,00	198,00	59,40

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
45	Ho Chi Minh city	North – South, East side	21,00	110,25	125,00	704,65	704,65
		Ho Chi Minh city – Long Thanh – Dau Giay		102,00			
		Ho Chi Minh city – Moc Bai		131,60			
		Ring road 3, Ho Chi Minh city	104,00	360,80			
<b>VIII</b>	<b>Mekong Delta</b>						
46	Long An	North – South, East side	105,00	41,25	105,00	297,24	220,44
		North – South, West side		255,99			
47	Tien Giang	North – South, East side	42,00	322,50	42,00	322,50	322,50
48	Vinh Long	North – South, East side		102,00	0,00	102,00	102,00
49	Dong Thap	North – South, East side		61,20	0,00	278,18	278,18
		North – South, West side		216,98			
50	An Giang	North – South, West side		48,76	0,00	400,76	400,76
		Soc Trang – Can Tho – Chau Doc		352,00			
51	Kien Giang	North – South, West side		963,39	0,00	877,39	701,91
		Ha Tien – Rach Gia – Bac Lieu		814,00			
52	Can Tho	North – South, East side		92,00	0,00	377,94	377,94
		North – South, West side		21,94			
		Soc Trang – Can Tho – Chau Doc		264,00			

No	Province Name	The Highway pass through	Occupying land (ha)		Sum (ha)		Agricultural land (ha)
			Occupied land	Added land	Occupied land	Added land	
53	Hau Giang	North – South, East side		322,00	0,00	564,00	564,00
		Ha Tien – Rach Gia – Bac Lieu		88,00			
		Soc Trang – Can Tho – Chau Doc		154,60			
54	Soc Trang	Ha Tien – Rach Gia – Bac Lieu		44,00	0,00	154,00	154,00
		Soc Trang – Can Tho – Chau Doc		110,00			
55	Bac Lieu	North – South, East side		184,00	0,00	360,00	360,00
		Ha Tien – Rach Gia – Bac Lieu		176,00			
56	Ca Mau	North – South, East side		92,00	0,00	92,00	92,00
	<b>Total</b>				<b>2.916,20</b>	<b>38.187,62</b>	<b>24.167,34</b>
					<b>41.103,82</b>		

### **3.3 NO.140/QD-TTG (DECISION): DETAILED PLANNING ON THE EASTERN NORTH-SOUTH EXPRESSWAY**



**PRIME MINISTER**

No: 140/QĐ-TTg

**THE SOCIALIST REPUBLIC OF VIETNAM**  
**Independence - Freedom – Happiness**

*Ha Noi, January 21st 2010*

**DECISION**

**Approve Plan in detail the Eastern North-South Expressway**

**PRIME MINISTER**

Pursuant to Law on Government Organization dated 25/12/2001;

Pursuant to for Vietnam Expressway Network Development until 2020 and beyond

Considering proposal of MOT ( Report No.6803/TTTr-BGTVT dated 30/09/2009) on Plan in detail North-South Expressway,

**DECISION**

**Article 1.** Approve Plan in detail North-South Expressway, East with the following contents:

**A. VIEWPOINT, TARGET:**

- North-South Expressway, East connect hanoi to Can Tho is one part of Vietnam Expressway, approved by Prime Minister at Decision No. 1734/QĐ-TTg dated 01/12/2008;

- Plan in detail North-South Expressway, East aims to connect implemented and on-going projects, meanwhile, to be basis for Ministries, branches and locals to implement plans for socio-economic development, construction, land using and other related plans;

- early form North-South Expressway, East connecting key economic centers, important transport hubs, creat possibility to high link with other means of transport (railway, port, airport, ...) to improve transport capability on North-South corridor, solve traffic congestion on National Highway No. 1, especially big cities' gateways;

- The section is planned with fully scale. During implementation progress, construction can be parted, consistent with traffic volume and budget mobility possibility, but, for the 1<sup>st</sup> stage, at least 4 lanes and land fund controk for widen in later stages are necessary.

**B. CONTENT**

**I. DIRECTION**

- Starting point: at Phap van (connect Ring Road 3 and Phap Van-Cau Gie Expressway).
- Ending point: Can Tho. In the 1<sup>st</sup> stage, the expressway section connects with Cha Va interchange in the North of Can Tho Bridge Project. In later stage, it connect with Quang Lo – Phung Hiep section, leading to Ca Mau.
- Direction:

Direction of each section as follows:

1. Phap Van – Cau Gie (according to the on-going direction with the scale of 4 through lanes).

From Phap Van Interchange (between Ring Road 3 of Hanoi City and Pha Van – Cau Gie expressway), the route is 1 – 1,5 km to the East of National Highway 1A old, cross Yen So, communes: Tu Hiep, Ngu Hiep, Lien Ninh (thanh tri District); Lien Phuong, Quat Dong, Thang Loi, To Hieu, Van Diem, Minh Cuong, (Thuong Tin District); PhuMinh (Phu Xuyen District); and end at km no. 210 (station NH 1A new) on Phap Van – Cau Gie section.

The length is 30 km.

**2. Cau Gie – Ninh Binh section** (according to the on-going direction with the scale of 6 lanes)

From km 210 (station NH 1A new) on Phap Van – Cau Gie section, the route turns left to connect with NH 38 at Vuc Vong (about 2km from NH 1A junction and existing NH 38, toward Yen Lenh Bridge). The route crosses over Chau Giang River toward East of Phu Ly, cross NH 21A and Thong Nhat railway, continuing toward the East of NH 1A, connect with NH 10 at Cao Bo interchange (about km 131 + 477, according to NH 10 station).

The length is 50 km.

**3. Ninh Binh – Thanh Hoa (Nghi Son)**

From Cao Bo interchange (between Cau Gie – Ninh Binh stage 1 and NH 10), the route crosses over Day River at Ninh Phuc Port lower section, parallels with the constructed Ninh Binh city avoiding route, cross NH 1A and Thong Nhat railway at Vo Bridge area on NH 1A to the West of NH 1A.

The route crosses NH 12B at the area of village Yen Thinh, Yen Binh commune at the position 3km from Genh junction, then to the North West of Tam Diep cement factory. The route crosses over Tam Diep range, to Ha Trung farm, outside of Bim Son town, cut PR 512, to the West of Tam Quy bassia forest resource preservation area, cut NH 217 at Ha Linh commune, cross over Ma River near Bong junction, Do Mountain in the West of Thanh Hoa City, cut NH 45 and 47, then toward the West of Thong Nhat railway, cross over Yen My Lake and end at Nghi Son – Bai Tranh road (belongs to Ho Chi Minh road project).

The length is about 121 km.

**4. Thanh Hoa (Nghi Son – Ha Tinh (Hong Linh town))**

From the crossing point with Nghi Son – Bai Tranh, the route crosses over Mong Ga Mountain and Hoang Mai River, Ba Chop Mountain at the area between Khe May Lake and Dong Lam Lake then turn right and cut PR 537, cross through Cau Giat – Nghia Dan railway, and cut NH 48 at Dien Hoai commune. The route continue to the west of NH1A about 2km, cut PR 538 and crossing NH 7 at the West of Tan Huong village, and cut the interstice of Ong mountain and Muc Mountain, cross over Than Vu Mountain then cross over the West of O O River, continuing toward Nghi My commune, Nghi loc District. The route cuts PR 534, cross over the branches of Cam River of Nghi Cong Bac, Nghi Cong Nam communes, Nghi Loc Dicstrict.

In the area of Hung Nguyen commune, the route crosses through Hung Yen, Hung Tay communes, cross the NH 46 to the West avoids Vinh City at Hung Dao Commune, cut PR 558, cross over Thong Nhat railway at Hung Tien Commune, Hung Nguyen District, go ahead and cross over the interstice of Thanh Mountain and Non Mountain, cross over Lam River, and cross NH 8A at Duc Thinh Commune, Duc Tho District, Ha Tinh Province.

The length is about 97 km.

**5. Ha Tinh (Hong Linh Town) – Quang Binh (Bung)**

From NH 8A Interchange, cross through Duc Thuy, parallel to the East of NH 15A, cross PR 6, to the east of Dong Loc, cross PR 2, 3, 17, then to the East of Ke Go River, cross Cam Son, Cam Lac, Ky Phong. From Ky Phong, cross through Ky Van and cross Vung Ang port to Lao, parallel to the West 500 KV, The West of Kim Son River Road 22 to the West of Vuc Tron Lake, cross through Quang Tien, Quang Luu, Quang Truong. The route crosses NH 12A, cross over Gianh River at Con Ngua, cross North-South railway toward Tan Thanh, then connect to Ho Chi Minh Road at the South of Bung Bridge of Bo Trach District, Quang Binh Province.

The length is about 145 km.

**6. Quang Binh (Bung) – Quang Tri (Cam Lo)**

The route runs along Ho Chi Minh Road which is constructed in the stage 1, cross through Con, Long Dai, My Duc, Ben Quan.

Avoiding section starts from Quyet Thang then turn right to downstream of Phu Vinh, parallel to the West of 500 KV Dong Son Ward then connect to Ho Chi Minh Road at Khe Cu Bridge area. The length of avoiding section is about 10 km.

The length is about 117 km.

#### **7. Quang Tri (Cam Lo) – Da Nang (Tuy Loan)**

From the point of intersection with NH 9, the route goes toward to Nghia Hy dam, cross over Thach Han River 3km from upstream, cross through Truong Phuoc Mountain, cross through My Chanh, O Lau rivers to Hoa My. From here, the route goes along foothill and crossing Bo River to PR 16. Then the route goes along foothill to avoiding section Hue City go 15,5 km with Hue City's avoiding route (constructed on the scale of grade III delta); avoids the fertilizer factory, Hue City cemetery, Khe Lu Lake, PR 14B (LA Son) PR 14B PR 14B km13 PR 14B, Ha Ly Khe Tre. Khe Tre Bach Ma national garden, Da Nang City, De Bay, Mui Trau mountain passes, Hai Van - Tuy Loan toward Tuy Loan.

The length is about 182,48 km (15,5 km Hue avoiding route, 14km South Hai Van toward Tuy Loan)

#### **8. Da nang – Quang Ngai**

From Tuy Loan Town, Hoa Vang District, Da nang city-the route goes to the west of NH 1A and Thong Nhat Railway, cross over Tuy Loan and Yen Rivers, avoiding Dien Tien – Dien Ban to the West and run under Bo Bo Mountain. The route crosses over Thu Bon River at the upstream point of Ky Lam Bridge on the North-South railway. After crossing over Thu Bon River the route continue to cross over Ba Ren River and PR 610.

After crossing over My Son interchange, the route turns left and cross over Eo mountain then go straight to the crossing point with PR 616, run under foothills to the west of Nui Thanh Town, to downstream of Ho May dam then turn right, parallel with North-South Railway to Dung Quat Interchange.

From Dung Quat Interchange turns left, cross over Tra Bong River to Binh Son Interchange, to the West of Tinh Tho, Tinh Ha communes, cross over PR 632B, Tra Khuc River, PR 623 then connect to ring road of Quang Ngai City.

The length is about 130 km.

#### **9. Quang Ngai – Binh Dinh**

From the Interchange with the ending point of Da Nang – Quang Ngai the route continues to the West of NH 1A and Thong Nhat railway, cross over Cho Chua Town, Hanh Duc, Hanh Phuoc Communes; cross over Ve River to Hanh Thinh. From Hanh Thinh, turns left, cut PR 628, cut NH 24 in Hiep An. The route continues to cross Pho Minh, Pho Hoa, Pho Cuong, cross over Chu Mountain to Hoai Son Commune (Tam Quan, Binh Dinh). Continuing to cross over Hoai Phu, Hoai Hao, Hoai Thanh Tay Communes (Hoai Nhon, Binh Dinh), cross over Lai Giang River at upstream of Lai Giang dam about 1km to Hoai An District. The route goes closely to Tang Bat Ho Town, cross over Don Bong and Hoan Xay Mountain, cross PR 631, cross through An Tuong Dong Commune. The route continues running under foothills and cross Ong mountain then go under Giang Mountain toward My Hoa Commune, cross through My Hiep Commune, then cross PR 634 to the West of Mot Mountain. From Phu Cat, turns right to the West of Phu Cat Airport, cross PR 636. The route cross over Con River of Tay Vinh and Nhon Phu Communes, cross PR 636B and go under Cha Ray, Thom Mountains, cross NH 19 in Nhon Tan Commune, An Nhon, Binh Dinh.

The length is about 169,5 km

#### **10. Binh Dinh – Nha Trang**

From the Interchange with NH 19, the route crosses over An Tuong River Dung and Ong Dau Mountains. The route crosses over Thong Nhat Railway and PR 638, Ha Thanh River in the North Tan Vinh Station. Parallel to Ha Thanh River in the North of Tan Vinh station. The route continue running parallel on the right of ha Thanh river, to The East of Van Canh Town, crosses over Muc Thinh mountain pass to Phu Yen. Parallel to the East of Thong Nhat railway and PR 641 to Xuan Long Commune, to the East of La Hai, cross over Ky Lo River, PR 641, Thong Nhat railway to Xuan Son Nam toward NH 1A. Parallel to the West of NH 1A, connect to Tuy Hoa avoiding route, cross NH 25, cross Da Rang River by Da Rang Bridge, cross over Hoa Xuan Tay Commune, to downstream of Han Dam then connect to Ca, Co Ma mountain pass Tunnels; continues to parallel to the West of Nh 1A, along downstream of Hoa Son dam, Van Binh, Van Phu, Van Luong, Van Hung Communes (Van Ninh, Khanh Hoa); go along mountain through Ninh Trung, Ninh Than, Ninh Xuan Communes, connects with NH 26 at the west of Tuy Hoa Sugar Factory about 1km, go along Suoi Trau lake, cross over Khanh Binh (Khanh Vinh), Dien Xuan, then cross PR 65-22 (PR 2) at Dien Tho, Dien Khanh, Khanh Hoa.

The length is about 215 km.

#### **11. Nha Trang – Phan Thiet**

From Interchange with PR 65-22 (PR2), the route continues to the West of NH 1A, crosses Dien Loc, Suoi Tien Communes (Dien Khanh), Suoi Cat, Suoi Lan Communes (Cam Lam), to the West of Suoi Dau industrial area and Cam Ranh Thuong Lake to Cam Hiep Commune. Da Ma mountain Cam An Bac, Cam Phuoc Tay Communes, Eastern Hon Ong Mountain toward Cam Thinh Dong. Western BaTu and Hon Dung Mountains, Cam Thinh Tay Commune, (Cam Ranh) Eastern Giac lan, Ba Rau, Co Lo, Ong Ngai range... to Phuoc Trung Commune, to the West of Thanh Son Airport. Cross NH 27 Dinh River by Nhan Hoi Bridge (Cai River)Phuoc Son, Nhi Ha Commune, Vung Mountain by tunnel to Binh Thuan. The route continues to the West of Thong Nhat Railway and coming high-speed rail intended to pass Phong Phu, Hai Ninh, Song Luy, Binh Tan, Hong Liem, Ham tri (Ham Thuan Bac) about 1 km to the North, pass Thuan Minh cross through Thong Nhat Railway, Phan Thiet, connect to NH 1A toward My Thanh the West of Ham Kiem I Industrial Area.

The length is about 226 km

#### **12. Phan Thiet – Dau Giay**

From Interchange with NH 1A to My Thanh, to the South of Du Du lake then to the North of Tan lap lake, cross with NH 55 near Song Phan Commune People Committee. The route continue crossing PR 720 then to the North of Tan Duc Industrial Zone (planning); crossing NH 1A at the South of Xuan Loc Industrial Zone. Crossing PR 765 at South of NH 1A belong to Suoi Cat Commune, cross NH 1A (Bao Dinh) toward Suoi Vong Lake in Xuan Bao Commune, cross PR 56 near border between Long khanh Town and Cam My District, then connect to Ho Chi Minh - Long Thanh – Dau Giay Expressway at approximately km 43 ( station Ho Chi Minh - Long Thanh – Dau Giay Expressway).

The length is about 98 km

#### **13. Dau Giay – Long Thanh**

From the end of Dau Giay Interchange of Ho Chi Minh - Long Thanh – Dau Giay Expressway (ending point of Phan Thiet – Dau Giay), the route goes to the direction of this expressway to the crossing point with Ho Chi Minh – Bien Hoa – Vung Tau (km 24+450 of Ho Chi Minh - Long Thanh – Dau Giay Expressway; km 16+730 of Bien Hoa - Vung Tau Expressway) then go along Bien Hoa - Vung Tau Expressway to Long Thanh Interchange at about km 29 of the Expressway (the starting point Long Thanh to Ben Luc).

The length is about 43 km

#### **14. Long Thanh – Ben Luc**

Bien Hoa – Vung Tau Expressway (km 29 of Bien Hoa – Vung Tau Expressway) Thi Vai River, Ring road Nho Trach city, to the left of 220 KV and 500 KV to Phuoc Khanh, cross over Long Tau River by Phuoc Khanh Bridge. PR 15 near Binh Khanh primary school, continue to the right of 220 KV and 500 KV, cross over Soai Rap river by Binh Khanh bridge and cross over the

Canals: Ba Minh, BAN Dua, Thay Cai, Ong Luong, Ba Lao, to the South of Da Phuong factory, cut NH 50 , the cross over Can Giuoc, cut NH 1A at about km 1923+700 then connect to Ho Chi Minh – Trung Luong Expressway at the South of Cho Dem Interchange (2,9 km to the South Cho Dem Interchange).

The length is about 58 km

#### **15. Ben Luc – Trung Luong**

The route goes along Ho Chi Minh – Trung Luong expressway (under construction). From Cho Dem Interchange in Binh Chanh, Ho Chi Minh city, parallel to the West of NH1A distance is about 1,5 – 4 km. The route crosses over Vam Co Dong and Vam Co Tay River by Ben Luc Bridge and Tan an Bridge then connect to Than Cuu Nghia Interchange in Chau Thanh Commune, Tien Giang Province.

The length is about 37km.

#### **16. Trung Luong – My Thuan – Can Tho**

From Trung Luong to Bac My Thuan the route goes to the West and basically parallel with NH 1A. The sections on My Thuan Bridge, in early stage will use current road and bridge of My Thuan Bridge Project with the length of about 2km. In the future, My Thuan road and Bridge will be studied for expressway at upstream of existing My Thuan Bridge.

The section from the South of My Thuan Bridge to Can Tho, the route goes to the West, parallel with NH 1A, average distance is about 3km.

The ending point at Cha Va Interchange (cut NH 1A, the starting point of Can Tho Bridge project).

The length is about 92 km

## **II.SCALE AND SPECIFICATIONS**

The whole expressway route from Ha Noi to Can Tho (excluding Can Tho Bridge Project) is about 1,811km. The length of each section, planned scale and specifications for each section of North- South Expressway, East are shown in Appendix I, attached with this decision.

In order to manage generally the whole route, build 3 main centers in the North, Central and South. Those Regional Main Centers connect road operators of the sections to generally operate, monitor management and operation on the whole North-South expressway, East, in particular and whole Vietnam Expressway, in general.

## **III. OCCUPIED AREA**

The occupied area of Eastern North – South Expressway for each province, city is listed in Appendix II which issued with this Decision.

## **IV. IMPLEMENTATION PROGRESS**

Based on estimated transport demands, social – economic development situation, investment period of the sections of eastern north-south expressway, construction progress of the sections are presented in Appendix III issued with this Decision.

Depending on the situation of economic-social development situation in particular stages can adjust the construction progress of each section accordingly.

## **V. INVESTMENT CAPITAL DEMAND**

- Period from now to 2020: construction of 1.469km (including expand the section Phap Van – Cau Gie) with the total investment about 272.600 billion VND.

- Period after 2020: construction of 342km (including expand the section Dau Giay – Long Thanh, Ben Luc- Trung Luong) with the total investment about 68.723 billion VND.

Total of investment capital demand for construction of 1.811 km Eastern north-south expressway about 312.862 billion VND.

## **VI. INVESTMENT CAPITAL SOURCE**

Investment capital for construction of eastern north – south expressway raised from the following investment source:

- Investment capital source from state budget in the form of government loan or guaranteed loan;
- Investment capital source is mobilized by investors in construction form such as BOT (Build-Operation-Transfer), BTO(Build-Transfer-Operation), BT(Build-Transfer), PPP(Public-Private-partnership) ..., in which might be included a part of state budget.

### **Article 2. Implementation**

#### **1. Ministry of Transport**

- Completion of environment assessment report early as prescribed;
- Responsible for management and implementation of Planning;
- Prepare project for the remaining sections as the basis for calling investment and set up the stationary post and handover the management to the local authority.

#### **2. Related ministries and organizations:**

According to the functions, duties and power shall coordinate with the MOT and People's committees of provinces and cities to implement the aims of Planning, ensure the consistency, synchronized with implementation of the Vietnam Social-Economic Development strategy vision towards 2020 and after 2020, the social-economic development planning of each agency and province.

#### **3. Related People's committees of provinces and cities:**

- Coordinating with MOT and ministries, agencies to implement the expressway network construction.
- Review and adjustment the Planning, projects on local areas in accordance with the contents of this Planning.
- Approve and decision under the authority the converse of land use purpose to expressway network construction under the land law; strict management of land fund for Planning implementation.

**Article 3.** this Decision takes effect since January 1<sup>st</sup> 2010 issued with this Decision including 3 Appendixes.

**Article 4.** The ministers, head of ministerial agencies, heads of Government agencies, President's Committee of province and cities related shall implement this Decision.

#### **Achievements:**

- The Secretariat of the Party Central Committee;
- National Assembly Standing committee;
- Prime minister and vice prime ministers;
- Ministries, ministerial agencies, government agencies;
- People's Council, Provincial and cities under central administration People's Committees;
- Central Office and Boards of Party;
- Office of National assembly;
- Office of the President ;
- Supreme People's Court of Vietnam;
- Supreme people's Procuracy of Vietnam;
- State audit;
- Office of the Government: Minister- Chairman,, Vice Chairmen/Chairwomen, Departments of: General economic, General, Domestic Administration, International relation, local, editorial secretariat, electronic information ;
- Archives, Economic sector (5).

**PRIME MINISTER**

**(signed)**

**Nguyễn Tấn Dũng**

### Appendix I

#### Scale, Total of investment capital and construction period

(Issued with Decision No. 140 QĐ/TTg dated January 21<sup>st</sup>, 2010 by Prime Minister)

No.	Section	Starting point	Ending point	Length	Lane scale	Total investment (billion VND)	Construction time
1	Phap Van – Cau Gie	Phap Van Interchange (Hanoi)	Cau Gie ( Hanoi)	30	6	1.350	2017-2018
2	Cau Gie – Ninh Binh	Cau Gie (Hanoi)	Cao Bo Interchange(Nam Dinh)	50	6	9.650	Under construction
3	Ninh Binh – Thanh Hoa ( Nghi Son)	Cao Bo Interchange	Nghi son	121	6	25.289	2011-2014
4	Thanh hoa ( Nghi son ) – Ha Tinh ( Hong Linh)	Nghi Son	Hong Linh province	97	4-6	19.850	2012-2015
5	Ha Tinh ( Hong Linh) – Quang Binh (BUng)	Hong Ilnh interchange	Bung	145	4	25.362	2019-2023
6	Quang Binh ( Bung)- Quang Tri (Cam Lo)	Bung	Cam Lo	117	4	12.051	2019-2023
7	Quang tri (cam lo) – Da Nang(Tuy Loan)	Cam Lo	Tuy Loan	182	4	24.591	2015-2019
8	Da Nang – Quang Ngai	Da Nang city	Quang Ngai city	130	4-6	25.035	2011-2014
9	Quang Ngai – Binh Dinh	Quang Ngai city	An Nhon, Binh Dinh	170	4	29.750	2016-2019

10	Binh Dinh – Nha Trang	An Nhon, Binh Dinh	Dien Khanh, Khanh Hoa	215	4	35.905	2017-2020
11	Nha Trang – Phan Thiet	Dien Khanh, Khanh Hoa	Phan thiet city	226	4-6	35.708	2011-2014
12	Phan Thiet – Dau Giay	Phan thiet city	Dau Giay, Dong Nai	98	4-6	16.170	2011-2014
13	Dau Giay – Long Thanh	Dau Giay	Long Thanh, Dong Nai	43	6-8	16.340	Under construction (1 <sup>st</sup> phase)
14	Long Thanh – Ben Luc	Long Thanh – Dong Nai	Ben Luc, Long an	58	6-8	22.620	2012-2016
15	BenLuc – Trung Luong	Ben Luc, Long An	Trung Luong	37	8	14.970	Under construction (1 <sup>st</sup> phase)
16	Trung Luong- My thuan – Can tho	Trung Luong	Can tho	92	6	26.700	2011-2015
	<b>Total</b>			<b>1811</b>		<b>34.323</b>	



**Phụ lục II**  
**Statistic Occupied Areas**  
(Issued with Decision No. 140 QĐ/TTg dated January 21<sup>st</sup>, 2010 by Prime Minister)

No.	Section	Province, City	Provincial Occupied area							Note
			Occupied area	Intending occupied area	Land for house	Agriculture land	Forest land	Industrial land, planting land	Other (pond, lake)	
1	Phap Van – Cau Gie	Hanoi	240,00	23,61	0,71	11,81	0,00	3,54	7,56	Occupied area in detail is intending occupied area
2	Cau Gie - Ninh Binh	Hanoi	19,20	2,89	0,09	1,59	0,14	0,58	0,49	Occupied area in detail is intending occupied area
3	Ninh Binh – Thanh Hoa(Nghi Son)	Ha Nam		122,40	8,57	55,08	8,57	24,48	30,60	
		Nam Dinh		102,00	3,67	55,08	8,57	24,48	30,60	
4	Thanh Hoa (Nghi Son)- Ha Tinh (Hong Linh)	Ninh Binh		143,75	10,69	100,13	9,88	8,23	14,82	
		Thanh Hoa		612,54	45,56	426,66	63,13	49,12	28,07	
		Thanh Hoa		35,00	5,25	19,25	4,72	4,20	1,58	
5	Ha Tinh (Hong Linh) – Quang Binh (Bung)	Nghe An		600,00	91,35	274,05	133,72	77,42	23,46	
		Ha Tinh		45,46	6,30	25,20	7,95	4,61	1,40	
		Ha Tinh		830,40	13,70	507,10	251,20	58,40	0,00	
6	Quang Binh (Bung) – Quang Tri (Cam Lo)	Quang Binh		324,80	1,57	33,71	273,52	0,00	16,00	
		Quang Binh		515,23	4,19	4,19	62,24	311,20	133,41	
		Quang Tri		271,20	1,34	0,00	0,00	228,00	41,86	
7	Quang Tri (Cam Lo)– Da nang(Tuy Loan)	Quang Tri		170,49	5,11	76,72	25,57	34,10	28,98	
		Hue		360,00	10,80	144,00	54,00	72,00	79,20	

	Da Nang		191,11	5,73	86,00	28,67	38,22	32,49	
8	Da Nang (Tuy Loan) – Quang Ngai	Da Nang	26,76	0,80	14,72	4,01	5,35	1,87	
		Hue	386,40	11,59	212,52	57,96	77,28	27,05	
		Quang Ngai	148,00	5,52	101,20	27,60	36,80	12,88	
9	Quang Ngai – Binh Dinh	Quang Ngai	450,22	5,43	52,80	160,42	83,20	148,37	
		Binh Dinh	745,22	9,61	54,40	168,00	394,58	118,63	
10	Binh Dinh – Nha Trang	Binh Dinh	248,35	3,19	0,00	126,40	93,60	25,16	
		Phu Yen	622,12	3,69	96,51	426,40	74,24	21,28	
		Khanh Hoa	728,64	2,27	160,00	442,69	102,40	21,28	
11	Nha Trang – Phan Thiet	Khanh Hoa	426,55	0,97	68,00	148,00	209,58	0,00	
		Ninh Thuan	696,00	0,24	0,00	625,60	58,40	11,76	
		Binh Thuan	949,38	1,39	59,60	24,00	607,79	17,84	
12	Phan Thiet – Dau Giay	Binh Thuan	351,00	3,51	70,20	52,65	70,20	154,44	
		Dong Nai	348,00	5,22	69,60	52,20	69,60	151,38	
13	Dau Giay – Long Thanh	Dong Nai	171,50	5,15	34,30	25,73	34,30	72,03	
		Dong Nai	31,30	1,57	4,70	4,70	6,26	14,09	
14	Long Thanh – Ben Luc	Ho Chi Minh city	348,20	17,41	52,23	52,23	69,64	156,69	
		Ho Chi Minh city	7,35	2,33	1,10	1,10	1,47	1,35	Occupied area in detail is intending occupied area
		Long An	44,25	2,21	6,64	6,64	8,85	19,91	
15	Ben Luc – Trung Luong	Tien Giang	399,33	15,97	199,67	59,90	79,87	43,93	
		Vinh Long	140,66	5,63	70,33	21,10	28,13	15,47	
	<b>Total</b>		<b>1.1656,10</b>	<b>312,83</b>	<b>3.134,79</b>	<b>3.418,79</b>	<b>3.051,14</b>	<b>1.499,80</b>	

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**Phụ lục III**  
**Planning on the eastern north – south expressway**  
 (Issued with Decision No. 140 QĐ/TTg dated January 21<sup>st</sup>, 2010 by Prime Minister)

No.	Section	Lengt h(km)	Construction plan											Note				
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		After 2020			
1	Phap Van – Cau Gie	30																Expand
2	Cau Gie - Ninh Binh	50																Under construction
3	Ninh Binh – Thanh Hoa	121																2011-2014
4	Thanh Hoa- Ha Tinh	97																2012-2015
5	Ha Tinh – Quang Binh	145																2019-2023
6	Quang Binh – Quang Tri	117																2019-2023
7	Quang Tri – Da nang	182																2015-2019
8	Da Nang – Quang Ngai	130																2011-2014
9	Quang Ngai – Binh Dinh	170																2016-2019
10	Binh Dinh – Nha Trang	215																2017-2020
11	Nha Trang – Phan Thiet	226																2014-2017
12	Phan Thiet – Dau Giay	98																2011-2014
13	Dau Giay – Long Thanh	43																Expand after 2020
14	Long Thanh – Ben Luc	58																2012-2016
15	Ben Luc – Trung Luong	37																Expand after 2020
16	Trung Luong – My Thuan – Can Tho	92																2011-2015
	<b>Total</b>	<b>1.811</b>																

**3.4 NO.05/2011/QĐ-TTĐ (DECISION): THE MASTER PLAN ON  
TRANSPORT DEVELOPMENT IN THE NORTHERN REGION UP  
TO 2020 WITH A VISION TOWARDS 3030**

**THE PRIME MINISTER**

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No. 05/2011/QĐ-TTg

**SOCIALIST REPUBLIC OF VIET NAM**

**Independence - Freedom – Happiness**

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*Hanoi, January 24, 2011*

**DECISION**

**APPROVING THE MASTER PLAN ON TRANSPORT DEVELOPMENT IN THE  
NORTHERN KEY ECONOMIC REGION THROUGH 2020 AND ORIENTATIONS  
TOWARDS 2030**

**THE PRIME MINISTER**

*Pursuant to the December 25, 2001 Law on Organization of the Government;  
At the proposal of the Ministry of Transport (Report No. 7873/Tlr-BGTVT of November 9,  
2010) regarding the master plan on transport development in the northern key economic  
region through 2020 and orientations towards 2030,*

**DECIDES:**

**Article 1.** To approve the master plan on transport development in the northern key economic region through 2020 and orientations towards 2030, with the following principal contents:

**I. DEVELOPMENT VIEWPOINTS**

1. The master plan on transport development in the northern key economic region must be in line with the regional socio-economic development orientations as well as national and local transport development strategies and plans.
2. To develop transport with strong breakthroughs as a prerequisite for accelerating regional socio-economic development so that the region can lead in the cause of industrialization and modernization, foreign investment attraction, international integration, and security, national defense and social order and safety maintenance.
3. To develop transport on the basis of promoting to the utmost the advantages of the region as a central region and a strategic gateway for both seaway and airway; to ensure linkage between road, inland waterway, railway, airway and airport transportation; and linkage between Hanoi capital as a transport hub and provinces and cities in the region.
4. To develop high-quality transportation at reasonable costs, reduce traffic accidents, limit environmental pollution and conserve energy; to step up the application of advanced transportation technologies, especially multimodal transportation and logistic services.
5. To attach importance to maintenance work for thoroughly tapping the capacity of existing transport infrastructure; to concentrate investment in urgent important works with priority given to those that help ease traffic congestion.

6. To strongly develop urban transport, especially in Hanoi capital. To closely link national and local transport systems, attaching importance to developing local transport, especially rural transport.
7. To mobilize all resources at home and abroad and encourage all economic sectors to invest in transport development in different forms.
8. To promote human resource advantages, apply advanced science and technology and enhance international cooperation in developing regional transport as a core for developing the entire transport sector.
9. To reserve a reasonable land fund for developing transport infrastructure and further assure traffic safety corridors.

## **II. DEVELOPMENT OBJECTIVES**

### 1. Development objectives through 2020

a/ Transportation: To meet the needs for cargo and passenger transportation with quality, safety and convenience and reasonable charges, control and reduce traffic accidents and limit environmental pollution on the basis of organizing rational transportation and strongly developing mass transit in urban centers, multimodal transportation and logistic services. Specific targets include:

The entire region's transportation volume will reach 450-500 million tons of cargo and 700-800 million passengers per year with an annual average growth rate of 9-10%. of which the volume of cargo to be handled at regional seaports will be 115-160 million tons/year, and the number of passengers to pass regional airports will be 25 million/year. Urban mass transit in Hanoi will account for 35%, in Hai Phong and other equivalent urban centers. 15-20%.

b/ Infrastructure facilities:

To upgrade the existing system of national highways up to prescribed technical standards; to accelerate the construction of expressways, striving to complete the construction of around 500 km of expressways by 2020. To upgrade provincial roads up to prescribed technical standards and build some new necessary routes. To further develop rural transport so that 80% of rural roads will be concreted.

To complete the renovation and upgrading of existing railway networks up to grade-1 national railway standards; to link, railways with international seaports, factories, economic zones, mining areas and major tourist centers. To rapidly develop large-volume iron-wheel transportation routes in urban centers, especially in Hanoi capital. To upgrade the Hanoi-Hai Phong railway into a electrified double-track railway. To complete the Yen Vien-Pha Lai-Ha Long-Cai Lan railway. To invest at an appropriate time in the Lao Cai-Hanoi-Hai Phong and Dong Dang-Hanoi railways and the north-south express railway.

To step by step upgrade and expand the system of seaports to meet cargo handling requirements in each period. To build some deep-water wharves up to international standards in Lach Huyen for ships of up to 100.000 DWT. and in Cai Lan for ships of up to 50,000 DWT. To develop on island districts ports of appropriate size to meet development needs and ensure security and national defense. To combine renovation and upgrading of

navigable channels to ensure convenience for ships to enter and leave wharves and compatibility with wharf sizes.

To upgrade inland waterways currently under regional management up to prescribed technical standards for ships to operate round-the-clock, and strive to increase the length of such inland waterways. To build new Plui Dong container port and major passenger ports in Hanoi, Hai Phong and Quang Ninh. To shift Hanoi port to mainly serve tourism in combination with the loading of clean cargo.

To upgrade and expand existing airports to meet demand in each period and step by step build new airports under planning. To complete Noi Bai T2 terminal before 2015. To study the construction of Tien Lang airport and put it into operation when Cat 13i airport operates at full capacity.

For Hanoi capital, to upgrade and expand existing urban transport infrastructure works and concurrently manage the maintenance of such works for efficient use.. To accelerate the construction of key works, including urban trunk roads, centripetal roads, bell roads, high-volume iron-wheel routes, and sialic traffic systems under the planning on expanded Hanoi capital for easing traffic congestions and meeting people's (ravel needs. To strive to reserve 15% of land areas for urban traffic.

For Hai Phong city and other cities and towns, to complete plans on. and step by step develop, urban transport infrastructure works and mass transit to meet people's needs.

## 2. Development orientations towards 2030

To satisfy social needs for transportation and transportation services up lo international standards, with high quality, fast, safety, and reasonable and competitive charges. To ensure convenient transfer among modes of transportation and among provinces and cities in the region with the whole country and countries worldwide.

To basically complete and modernize the transport infrastructure network. To further develop transport infrastructure facilities under planning.

## **III. DEVELOPMENT PLANNING**

### 1. Transportation development

To organize rational transportation on some major corridors, including:

- North-south corridor, with 4 modes of transportation: road, railway, seaway and airway. Long-distance cargo transportation will be mainly by sea and rail. Long-distance passenger transportation will gradually shift to railway and airway. Short-distance and intra-provincial transportation of cargo and passengers will be mainly by road.

- Hanoi-Hai Phong corridor, with 3 modes of transportation: road, railway and inland waterway. Passengers will mainly use road while cargo will be transported by road, rail and river.

- Hanoi-Quang Ninh corridor, with 3 modes of transportation: road, railway and inland waterway. Passengers will mainly use road and railway while cargo will be transported by road, rail and river.



- Hanoi-Lao Cai corridor, with 3 modes of transportation: road, railway and inland waterway. Due to terrain conditions, cargo and passengers will be transported mainly by road and rail.
- Hanoi-Lang Son corridor, with 2 modes of transportation: road and railway. Road transportation will be the overwhelming mode for both cargo and passengers.
- Ninh Binh-Hai Phong-Quang Ninh corridor, with 2 modes of transportation: road and inland waterway, of which road transportation be the overwhelming mode.

## 2. Transport infrastructure development

### a/ Roads

#### Highways

- Thang Long boulevard: from Trung Hoa junction to national highway 21A in Hoa Lac (Hanoi), 30 km long. 6 high-speed lanes and 2 urban roads on both sides.

- Hanoi-Hai Phong expressway: from belt road III (Hanoi) to Dinh Vu dam (Hai Phong city). 105.5 km long, 6 lanes.

Tan Vu-Lach Huyen section: from Tan Vu junction to Lach Huyen gateway port (Hai Phong city), 16-17 km long. 4 lanes in phase I. and 6 lanes in phase II, of which the Dinh Vu bridge-Cat Hai section is around 5 km long as a sea-crossing bridge.

- Hanoi-Viet Tri-Lao Cai expressway: from Noi Bai-Ha Long high-speed junction with national highway 2 (Hanoi) to Quang Kim commune (Bat Xat district, Lao Cai province), 264 km long (of which the section within the northern key economic region is around 60 km long), 4 lanes in phase I and 6 lanes in phase II.

- Hanoi-Thai Nguyen expressway: from km 152+400 on new national highway IA in Ninh Hiep (Gia Lam district, Hanoi) to km 61+313 on national highway 3 in Thinh Dan (Thai Nguyen city), 61.3 km long (of which the section within the northern key economic region is 35 km long), 4 lanes in phase I and 6 lanes in phase II.

- Lang Son-Bac Giang-Bac Ninh expressway: from Huu Nghi border gate (Lang Son province) to Nhu Nguyet bridge (Bac Ninh province). 130 km long (of which the section within the northern key economic region is 11 km long). 4-6 lanes.

- Noi Bai-Ha Long expressway: from Bac Ninh city (Bac Ninh province) to Ha Long city (Quang Ninh province). 136 km long, 4 lanes in phase I and 6 lanes in phase II.

- Ha Long-Mong Cai expressway: from Ha Long city to Mong Cai (Quang Ninh province), 128 km long, 4-6 lanes.

- Phap Van-Gie bridge expressway (belonging to the north-south expressway): from Phap Van junction (Hanoi) to km 210 on national highway 1A (Ha Nam province). 32.3 km long. It currently has 4 lanes and is planned to have 6 lanes.

- Hoa Lac-Hoa Binh highway: from Hoa Lac junction (Hanoi) to Hoa Binh city (Hoa Binh province). 26 km long (of which the section within the northern key economic region is around 15 km long). 6 lanes.

Doan Hung-Hoa Lac-Pho Chau expressway (belonging to the western north-south expressway): from Doan Hung (Phu Tho province) to Pho Chau (Ha Tinh province), 457 km

long (of which the section within the northern key economic region is 40 km long), 4-6 lanes.

- In the post-2020 period, to study the construction of the Ninh Binh-Hai Phong-Quang Ninh coastal expressway: from Ninh Binh city (Ninh Binh province) to Ha Long city (Quang Ninh province, 160 km long (of which the section within the northern key economic region is around 80 km long), 4 lanes.

#### National highways from Hanoi

- National highway 2: from km 13+600 (the boundary between Hanoi and Vinh Phuc province) to Thanh Thuy border gate (Ha Giang province) at km 312+500, which is 310 km long (of which the section within the northern key economic region is 50.6 km long), The 17-km section from km 13+600 to km 30+600 is already up to grade-II road standards, with 4 lanes. The remaining section will be upgraded at least up to grade-III road standards, with 2 lanes. The sections running through heavy-traffic areas will reach grade-I or -II road standards, with 4-6 lanes.

- National highway 5: from Nhu Quynh (Hung Yen province) at km 11 + 135 to Dinh Vu (Hai Phong city) at km 106+300, which is 95.2 km long, will be maintained at grade-II road standards, with 4 lanes.

- National highway 6: from Ha Dong (Hanoi) to Muong Lay (Lai Chau province). 512 km long (of which the section within the northern key economic region is 34 km long), will be upgraded up to grade-I or -II road standards, with 4-6 lanes.

- National highway 32: from Son Tay-Hanoi (km 41) to Binh Lu (Lai Chau province), 393 km long (of which the section within the northern key economic region is 22 km long), will be upgraded up to grade-III road standards. with 2 lanes.

#### Urban belt roads

- Belt road III. Hanoi: Noi Bai-Mai Dich-Thanh Xuan-Phap Van-Thanh Tri bridge-Sai Dong-Ninh Hiep-Viet Hung-Dong Anh-Tien Duong-Nam Hong. 55 km long, as an urban road with a median high-speed lane.

- Belt road IV (regional belt road): linking satellite industrial-urban zones surrounding Hanoi capital, including Phuc Yen (Vinh Phuc province); Me Linh; Hong Ha (Dan Phuong); Duc Thuong and An Khanh (Hoai Duc); Yen Nghia (Ha Dong); Thuong Tin (Hanoi); Me So and Nhu Quynh (Hung Yen province); Tien Son and Yen Phong (Bac Ninh province); Hiep Hoa (Bac Giang province); Pho Ni. on national highway 2 at around km 11 +300 (Hanoi), around 125 km long. 6-8 lanes.

Belt road V (regional belt road): linking satellite cities and towns surrounding Hanoi, including Vinh Yen-Son Tay-Hoa Lac-Xuan Mai-Mieu Mon-Phu Ly-Thai Binh-Hai Duong-Chi Linh-Bac Giang-Thai Nguyen, around 320 km long, grade-I road standards. 4-6 lanes.

#### Other national highways

- National highway 10: from Long Bi (Quang Ninh province) to Hoang Hoa (Thanh Hoa province), 228 km long (of which the section within the northern key economic region is 58.2 km long), will be upgraded up to grade-TT road standards, with 4 lanes.

- National highway 18: from the junction with national highway 1A in Dai Phuc (Bac Ninh province) to Bac Luan bridge (Quang Ninh province), 303 km long; to upgrade 124-km Mong Duong-Mong Cai (Quang Ninh province) up to grade-III road standards with 2 lanes;

to expand the 30-km Dong Bi-Tuan Chau (Quang Ninh province) section up to grade-II road standards, with 4 lanes.

- National highway 18C: from Tien Yen bridge to the Vietnam-China border (Quang Ninh province), 50 km long, will be upgraded up to grade-III road standards, with 2 lanes.

- National highway 38: from Bac Ninh city (Bac Ninh province) to Dau market (Ha Nam province), 81 km long (of which the section within the northern key economic region is 55 km long), will be upgraded up to grade-III road standards, with 2 lanes.

- National highway 39: from Pho Noi (Hung Yen province) to Diem Diet] (Thai Binh province). 108 km long (of which the section within the northern key economic region is 50.2 km long), will be upgraded up to grade-III road standards, with 2 lanes.

- National highway 21: from Son Tay town (Hanoi) to Hai Thinh (Nam Dinh province). 210 km long (of which the section within the northern key economic region is 46 km long), will be upgraded up to grade-III or -IV road standards, with 2 lanes.

- National highway 21B: from Phu Lam (Hanoi) to 13a Da bridge (Ha Nam province). 59 km long (of which the section within the northern key economic region is 41.6 km long), will be upgraded up to grade-III road standards. with 2 lanes.

- National highway 2B: from Doc Lap to Tarn Dao (Vinh Phuc province), 25 km long. To upgrade intra-city sections up to urban road standards and remaining sections up to grade-IV road standards, with 2 lanes.

- National highway 2C: from Son Tay (Hanoi) to Son Duong (Tuyen Quang province), 141 km long (of which the section within the northern key economic region is 44.9 km long), will be upgraded up to grade-III road standards, with 2 lanes.

- Hanoi-Hai Phong and Gie bridge-Ninh Binh express routes: from Hanoi-Hai Phong express junction and national highway 39 to the left of this highway. 2-4 km from Hung Yen city, crossing Pho I lien University of Culture, passing the Red River, with the same direction with that of provincial road 449, to Liem Tuyen junction (Gie bridge-Ninh Binh expressway). 47.7 km long. grade-II road standards, 4 lanes in phase I and 6 lanes in phase II.

## II. Regional linkage axes

- Belt roads:

National highway 4 system, including national highways 4A, 4B, 4C, 4D and 4E, from Quang Ninh province to Lai Chan province, around 687 km long (of which the section within the northern key economic region is 27 km long), will be step by step upgraded at least up to grade-IV road standards, with 2 lanes.

Section linking national highway 4B with Van Don economic zone (Quang Ninh province): from Tien Yen running west of Cai Bail island (the major island of Van Don economic zone) to existing Van Don bridge, around 32 km long. grade-III road standards. 2 lanes in phase I and 6 lanes in phase II.

National highway 279: from Bai Chay (Quang Ninh province) to Tay Trang (Dien Bien province). 744 km long (of which the section within the northern key economic region is 42.5 km long), will be upgraded at least up to grade-IV road standards, with 2 lanes.

National highway 37: from Diem Dien (Thai Binh province) to Co Noi (Son La province), 485 km long (of which the section within the northern key economic region is 85.3 km long),

will be upgraded at least up to grade-IV road standards, with 2 lanes in mountainous areas; and grade-III road standards, with 2 lanes in densely populated and delta areas.

- Coastal road: from Nui Do port and Mai Ngoc in Binh Ngoc commune, Mong Cai city (Quang Ninh province) to Ha Tien border gate in Ha Tien town (Kien Giang province), around 3.041 km (of which the section within the northern key economic region is 307.5 km long), at least grade-III road standards, with 2 lanes.

- Ho Chi Minh road: from Pac Bo (Cao Bang province) to Dat Mui (Ca Mau province), around 3.167 km long (of which the section within the northern key economic region is 49.6 km long), grade-III road standards, 2 lanes in phase I and 4-6 lanes in phase II.

On all national highways, to step by step expand the sections running through urban and densely populated areas under approved planning. To build by-pass roads in necessary urban centers. To consider the upgrading of some routes into national highways to meet practical needs and criteria of national highways provided in the Law on Road Traffic.

## b/ Railways

### Existing railways

- North-south railway: 1,726 km long (of which the section within the northern key economic region is 33 km long). To complete the upgrading of this railway up to grade-I national railway standards.

- Hanoi-Hai Phong railway: 106 km long. To complete the upgrading and electrification of the whole railway.

- Hanoi-Lao Cai railway: 296 km long (of which the section within the northern key economic region is 42.5 km long). To complete the upgrading of the whole railway up to prescribed technical standards.

- Hanoi-Dong Dang railway: 162 km long (of which the section within the northern key-economic region is 22.5 km long). To complete the upgrading of the whole railway up to prescribed technical standards.

-Dong Anh-Quan Trieu railway: 54 km long (of which the section within the northern key economic region is 18.5 km long). To complete the upgrading of the whole railway up to prescribed technical standards.

### New railways

- Hanoi-Ho Chi Minh City express railway: 1.570 km long (of which the section within the northern key economic region is 33.5 km long). To study the construction of the Hanoi-Vinh section at an appropriate time based on capital raising needs and capacity.

- Yen Vien-Pha Lai-Ha Long-Cai Lan railway: 128 km long. To build a single-track dual-gauge railway.

- Lao Cai-Hanoi-Hai Phong railway: 381 km long (of which the section within the northern key economic region is 128.5 km long). To study the construction of an electrified double-track railway of 1,435 mm.

- Dong Dang-Hanoi railway: 156 km long (of which the section within the northern key economic region is 22.5 km long). To study the construction of an electrified double-track railway of 1,435 mm.

In the post-2020 period, to study the construction of the following railways: the 120-km coastal Nam Dinh-Thai Binh-Hai Phong-Quang Ninh railway up to grade-I single-track railway standards, and the 11a Long-Mong Cai railway up to grade-II single-track railway standards; the 95-km Lang Son-Quang Ninh-Mui Chua railway up to grade-II single-track railway standards; and railways linking seaports and industrial parks. To completely link Hanoi capital's major railway with the Hanoi capital's inter-regional railway network.

c/ Seaways

#### Seaports

- Hai Phong port: This is a national general port and international holder gate (grade 1A) with the following functional zones:

Lach Huyen wharf zone: This is a major wharf zone of Hai Phong port which mainly handles containerized imports and exports on offshore routes for ships of 4,000-6,000 TEU and up to 100,000 DWT. Infrastructure and loading, managing and exploiting technologies will be modernized up to international standards. To build a logistics center in the adjacent industrial-service zone behind the harbor. Investment will focus on wharf bridges, technical infrastructure linking the national port network and the port logistics industrial-service zone. To build the zone to reach a capacity of 20.8-38.8 million tons/year.

Dinh Vu zone: This zone will mainly handle general container cargo on onshore routes for ships of 20,000-30,000 DWT. To build a special-use wharf to directly serve the zone's production-service establishment. To build the zone with a capacity of 18-20 million tons/year.

Cam river zone: This zone has the main function of handling local cargo for ships of 5,000-10,000 DWT; to step by step remove and shift the functions of the zone on the basis of reorganizing and making in-depth investment to maintain its capacity of 5-6 million tons/year. Chua Ve and Vat Cach are major wharves in this zone.

Chanh river zone (Yen Hung. Quang Ninh province): This zone is a special-use zone with a general container wharf for accommodating ships of 10,000-40,000 DWT. for Yen Hung-Nha Mac dam industrial park, for building and repairing ships using oil products (at Qua Muom islet). To build the zone with a capacity of up to 10-15 million tons/year.

Other special-use and satellite wharves will directly serve the riverside industrial-service zone and local wharves for small-sized vehicles in the region (including Diem Dien in Thai Binh province and Hai Thinh in Nam Dinh province). To develop these wharves according to the general construction planning as satellite wharves of Hai Phong port.

- Hon Gai port-Quang Ninh: This is a national general port in the region, embracing the general wharf zone. Cai Lan container wharf and other satellite special-use wharves.

Cai Lan zone: This is a major wharf zone of Cai Lan port, which mainly handles containerized and general cargo for ships of up to 50,000 DWT and containers of up to 3,000 TEU. To complete this zone with a port logistics center as an investment focus in the planning period. To build the zone with a capacity of 15-18 million tons/year.

Satellite special-use wharves: B12 oil special-use wharf, which will be gradually relocated and transformed. The sizes of special-use wharves of cement and thermo-power plants will be kept unchanged but in-depth investment will be made to raise their capacity and minimize adverse impacts on the environment. In the long term, to limit the development of

this kind of wharf in Cua Luc and Ha Long bays. To step by step develop special-use wharves for ship building and repair industries and for Cai Lan and Viet Hung industrial parks according to the general construction planning as satellite wharves of Cai Lan wharf zone. To completely build Hon Gai passenger wharf into a major wharf for international tourists and for the north-south road.

- Cam Pha port-Quang Ninh: This port will operate as a special-use port with a general container wharf mainly for coal mining activities of the Vietnam Coal and Mineral Industries Group, Cua Ong will be the major wharf zone to accommodate ships of 50.000-70.000 DWT at wharf bridges, and ships of 120.000 DWT in transshipment areas. To make in-depth investment but not expand south Trang bridge wharf and Cam Pha cement plant, which will be the port's satellite areas. To build the port with a capacity of 25-27 million tons/year.

- Hai Ha port-Quang Ninh: To step by step build a special-use port in association with the industrial park. In the initial phase, to build a special-use port with a general wharf for ships of 50,000-80.000 DWT. In the long term, to develop it into a major port in the region which will also handle transited cargo for southern China.

- Van Gia port-Quang Ninh: This is a local general port and a seaway gateway of Mong Cai border gate city. It consists of a transshipment area for ships of up to 10,000 DWT and satellite wharves for small-sized vehicles in Dan Tien and along Ka Long river. To build the port with a capacity of 3.5-4.5 million tons/year.

- Mui Chua, Van Hoa port-Quang Ninh: This is a local port for ships of 3.000-5.000 DWT. Mui Chua wharf is exclusively reserved for mining chemical industries, which also handles general cargo for Cao Bang and Lang Son provinces. Van Hoa general wharf will directly serve Van Don economic zone. To build the port with a capacity of 2-2.5 million tons/year.

Port channels: To dredge the outside section of the Lach Huyen wharf zone for ships of 100.000 DWT and container ships of 6.000 TEU to meet the standards of an international gateway port. The inside section in the Chanh river wharf zone will be for ships of 30,000-50.000 DWT, in the Dinh Vu wharf zone for ships of 20,000-30,000 DWT (half load draft), and in the Cam river wharf zone for ships of 10.000 DWT.

Dry ports: To build 5 dry ports in the region and economic corridor for cargo to be handled at Hai Phong and Quang Ninh ports.

- Coastal economic zone, which embraces the provinces of Thai Binh. Nam Dinh. Ha Nam. Ninh Binh and Hoa Binh, and western Hanoi, and will handle around 630.000 TEU/year.

- Hanoi-Lao Cai economic corridor, which embraces the provinces of Lao Cai, Yen Bai, Phu Tho. Vinh Phuc. Tuyen Quang and Ha Giang, and will handle 720.000 TEU/year.

- Hanoi-Lang Son economic corridor, which embraces the provinces of Lang Son, Cao Bang, Bac Giang and Bac Ninh, and will handle around 550.000 TEU/year.

- North West Hanoi economic zone, which embraces the provinces of Hanoi, Phu Tho, Hoa Binh, Son La, Dien Bien and Lai Chau, and will handle around 380.000 TEU/year.

- South East Hanoi economic zone, which embraces the provinces of Hanoi, Bac Ninh, Hai Duong, Hung Yen, Thai Nguyen and Bac Kan; and will handle around 1.300.000 TEU/year.

d/ Domestic seaways

Sections

- Lach Giang – Hanoi Section: 187 km in length. I-graded upgrading and focusing on improvement to allow ship of 1000 tons into III-graded flow standard; frequency responding to sailing water 70%.
- Quang Ninh – Ninh Binh Section (embraces Dao river and Luoc river): 266.5 km in length. Planning in 2 methods:
  - + Method 1: current flow over Dao river, Hai Phong province and III-graded plan.
  - + Method 2: flow into Lach Tray entrance, connect to Dong channel then keep going as method 1 and II-graded total plan. Improving Lach Tray river (49 km), Luoc river (72 km) and some sandbanks in Red river.
- Hai Phong – Hanoi section (over Duong river): 154 km in length, which passes through the rivers of Cam, Han, Kinh Thay, Thai Binh, Duong and Red. II-graded total plan.
- Hanoi – Viet Tri – Lao Cai section: 362 km in length. Remaining Hanoi – Viet Tri section in II-graded; upgrading Viet Tri – Yen Bai section to III-graded; developing dock and dam to allow ship  $0 \leq 300$  tons to Lao Cai.
- Quang Ninh – Pha Lai section: 128 km in length. II-graded total plan.
- Pha Lai – Da Phuc and Pha Lai – A Lu: 123 km in length. II-graded total plan.

#### Domestic port

To improve Khuyen Luong port to achieve capacity of 1.7 million tons/year, building Phu Dong port with capacity of 1.1 million tons/year, Chem port with capacity of 400.000 tons/year and a new one in the North of Hanoi with capacity of 2 million tons/year.

#### d/ Airways

- Noi Bai International Airport: is the largest airport in the Northern key economic region of the North, which can accept airplane A380 and as well. Renewing T1 railway station, newly build T2 station to raise capacity of 25 million passengers/year and 0.5 million tons cargo/year, total capacity of 50 million passengers/year and 2 million cargo/year in later stage.
- Cat Bi International Airport: improving, developing into the international airport, accept airplane B777 and as well, capacity of 4 million passengers/year and 0.4 million tons cargo/year. It will be moved to Tien Lang airport in 2020.
- Gia Lam airport: renewing and improving for local flight, accept airplanes of ATR72/F70 or as well, capacity of 167.000 passengers/year and 2.000 tons cargo/year.
- Quang Ninh airport: building Quang Ninh airport for travelling to world natural heritage, accept airplanes of A3320/321, capacity of 1 - 2 million passengers/year.
- Tien Lang International Airport: completing plan, building to replace Cat Bi International airport after 2020.

#### e/ Urban Transport and Local Transport

To develop urban and local transport according to approved plan of provinces and cities.

### 3. Planning Landscape

To plan landscape for developing national traffic infrastructure system in the Northern key economic region with plan of more than 97.000 ha, which occupies 6,2% of total area (regardless urban and local traffic).

## **IV. KEY SOLUTIONS AND POLICIES**

### 1. Solutions and policies on developing transport

- To make a fair business environment, encouraging all economic sectors to be in transportation business and services; renovating means, technology, facilities for transportation service, giving priority to transport by container, multi-method and logistic service to regulate transportation means.
- To make supporting policies and giving priority to public transport, especially mass transport and to control personal vehicles.
- To reasonably arrange transporting points, especially in Hanoi area, reduce the vehicle flow into city center which causes traffic jam.

### 2. Solutions and policies for developing traffic infrastructure facilities

- The period by 2015 focuses on traffic infrastructure facilities to raise the capability of linking region and transport means as well as solving traffic jam.
- To mobilize all sources, especially domestic sources, to facilitate to attract local and international investment from many economic sectors in many ways to develop traffic infrastructure facilities.
- To apply new technology and materials in developing traffic infrastructure facilities.
- To enhance the management of maintaining traffic infrastructure facilities system, especially to build up a capital for the management.

### 3. Solutions and policies for ensuring traffic safety

- To promote propagation, dissemination, education and to strengthen to force coercive laws on traffic safety.
- To verify traffic safety in all upgraded and newly built infrastructure, to strengthen to apply intelligent traffic technology to support and control traffic.
- To improve the quality of training, to test and manage drivers, quality of inspecting motor vehicles.



#### 4. Solutions and policies for protecting environment

- To closely manage the implementation of environment impact assessment of transport development projects, especially expressway and port projects passing through conservation areas; well-conducting supervision of environment management and strengthening regular test of environment protection in organization of transport construction, manufacture and business.
- To control quality of vehicles and fuel, reducing environment pollution; encouraging utilizing clean vehicles and fuel.

#### **Article 2.** Implementation Organization

1. The plan is to be managed and implemented under MOT along with other Ministry, Department and People's Committees of provinces and cities directly under the Central in the region. During implementing, consideration and evaluation to timely adjust to meet the actual demand.

2. Regional ministries, departments, provinces and cities directly under the Central should review the plans related to this plan, cooperating with MOT, Ministries and other locals during implementation to ensure feasibility and uniformity, creating continuous and linked transport system to raise capacity of whole network.

**Article 3.** This decision takes efficient since March 10<sup>th</sup>, 2011.

**Article 4.** Ministers, Headers of Ministerial, Headers of Government agencies, Chairman of People's Committees of provinces and cities in the northern key economic region should be responsible for implementing this decision.

## PRIME MINISTER

### **Receiver:**

- Party Central Committee Secretariat;
- Prime Minister, Deputy Prime Ministers;
- Ministries, Ministerial agencies, agencies under the Government;
- Office of the Central Steering Committee on anti-corruption;
- People's Committee of Provinces and Cities under Central;
- Central Office and Party Committees;
- Presidential Office;
- Nationalities Council and Committees of Congress;
- Parliament Office;
- The Supreme People's Court;
- Institute of the Supreme People's Procuracy;
- State Auditor;
- Committee of the National Financial Supervision;
- Bank for Social Policy;
- The Vietnam Development Bank;
- Fatherland Front of Vitenam;
- Central agencies of mass;
- Government Office: Chairman, Deputy Chairmen, Trade leads, Departments, Units, Gazette;
- Archived, Clerical, Economic Sector (5b)

**Nguyễn Tấn Dũng**

## APPENDIX

### LIST OF PROJECTS WITH PRIORITY TO DEVELOP TRASPOTATION IN THE NORTHERN KEY ECONOMIC REGION

*(Attached Decision No 05/2011/QĐ-TTg dated October 24<sup>th</sup>, 2011 by Prime Minister)*

NO	Project Name	Scale
<b>I</b>	<b>Road</b>	
1	Phap Van – Cau Gie expressway	32,3 km; 6 lanes
2	Noi Bai – Lao Cai expressway	264 km, included in 60 km, 4 – 6 lanes
3	Hanoi – Lang Son expressway	130 km, included in 11 km, 4 – 6 lanes
4	Hanoi – Hai Phong expressway	105,5 km, 6 lanes
5	Tan Vu – Lach Huyen section (embraces Dinh Vu – Cat Hai Bridge)	17 km (in which 5km Dinh Vu – Cat Hai Bridge) 4 – 6 lanes
6	Noi Bai – Ha Long expressway	136 km, 4 - 6 lanes
7	Ha Long – Mong Cai expressway	128 km, 4 - 6 lanes
8	Hanoi – Thai Nguyen expressway	61,3 km, included in 35 km, 4 – 6 lanes
9	Hanoi Ring road 3 (Period II)	55 km, urban area with expressway in middle
10	Nhat Tan – Noi Bai section	12,2 km, cross-section of 80 – 100 m.

11	Nhat Tan Bridge	3,9 km, cross-section of 33 m, 8 lanes
12	Mai Dich – Noi Bai section	12,2 km, cross-section of 29 m, 6 lanes
13	Vinh Thinh Bridge	5,5 km, cross-section of 16,5 m, 4 lanes
14	Hanoi – Hai Phong expressway link road and Cau Gie - Ninh Binh expressway	47,7 km, 4 – 6 lanes
15	NH 4B– Van Don link road	32 km, 6 lanes
16	Improve, upgrade and expand existing NH: NH 2C, old NH 3, NH 37, NH 39, NH 21...	III level, 2 lanes
<b>II</b>	<b>Railway</b>	
1	Yen Vien – Pha Lai – Ha Long – Cai Lan Railway	128 km, single lane road, dual gauge
	- Pha Lai – Ha Long section	
	- Yen Vien – Lim section	
2	Yen Vien – Ngoc Hoi	25 km, elevated railway (urban combined national railway)
3	Cat Linh – Ha Dong	13 km, urban railway
4	Noi Bai – city center - Thuong Dinh	33,9 km, urban railway
5	Nhon – Hanoi station – Hoang Mai	21 km, urban railway
<b>III</b>	<b>Domestic Seaway</b>	
1	Project on developing Delta transportation: - Quang Ninh – Viet Tri route - Quang Ninh – Ninh Binh route - Lach Giang – Hanoi route	Approximately 700 km, I – III level
2	Upgrading Quang Ninh – Hai Phong – Nam Dinh – Ninh Binh route	266,5 km, II – III level
3	Upgrading Tai Xa – Mui Chua route	31,5 km, allow ship of 100 tons
4	Improving traffic of Red river – Hanoi area	Allow ship of 1.000 tons
5	Project on improving safety of crossing-river station and rearranging domestic seaway traffic safety corridor order.	included in 7 provinces and cities

<b>IV</b>	<b>Seaway</b>	
1	Lach Huyen – Hai Phong Port	Allow ship of 100.000 DWT/6.000 TEU, capacity of 20,8 – 38,8 tons/year
2	Cai Lan – Hon Gai Port	Allow ship of 50.000 DWT/3.000 TEU, capacity of 15 –18 tons/year
3	Dinh Vu – Hai Phong Port	Allow ship of 20.000 - 30.000 DWT, capacity of 18 – 20 tons/year
4	Flow into Lach Huyen port – Hai Phong port	Allow ship of 100.000 DWT/6.000 TEU
<b>V</b>	<b>Airport</b>	
1	Noi Bai National Airport	Building parking place, rail-way in pedestrian and T2 cargo sections to achieve capacity of 25 million pedestrians/year, allow A380 airplane.
2	Cat Bi National Airport	Renewing, improving, expanding airport road, parking place to achieve capacity of 4 million passengers/year, allow B777 airplane
3	Quang Ninh Airport	Investing in construction to achieve capacity of 1 – 2 million of passengers/year, allow A320/321 airplane
4	Gia Lam Airport	Renewing, constructing to achieve capacity of 0,167 million of passengers/year, allow ATR72/F70 airplane

**3.5 No. 10/2010/TT-BGTVT (CIRCULAR): PROVIDING FOR ROAD ADMINISTRATION AND MAINTENANCE**

No. 10/2010/TT-BGTVT

*Hanoi, April 19, 2010*

## **CIRCULAR**

### **PROVIDING FOR ROAD ADMINISTRATION AND MAINTENANCE**

*Pursuant to the November 13, 2008 Law on Road Traffic; Pursuant to the Government's Decree No. 51/ 2008/ND-CP of April 22, 2008, defining the functions, tasks, powers and organizational structure of the Ministry of Transport; The Minister of Transport provides for road administration and maintenance as follows:*

#### **Chapter I**

#### **GENERAL PROVISIONS**

##### **Article 1. Scope of regulation**

1. This Circular provides for road administration and maintenance: the application of technical standards and norms on road administration and maintenance; and responsibilities for road administration and maintenance.
2. This Circular does not apply to expressways.

##### **Article 2. Subjects of application**

This Circular applies to agencies, organizations and individuals involved in road administration and maintenance.

##### **Article 3. Interpretation of terms**

In this Circular, the terms below are construed as follows:

1. *Road administration agencies* include an agency performing the specialized state management function under the Ministry of Transport and specialized agencies under People's Committees of provinces or centrally run cities. People's Committees of districts, towns or provincial cities and People's Committees of communes, wards and townships.
2. *Road works* include roads, standing and parking places on roads, traffic light signals, road signs, road markings, marker posts, fences, traffic islands, median strips, milestones, walls, embankments, water discharge systems, vehicle weight checkpoints, toll booths and other support road works and equipment.
3. *Technical infrastructure system* consists of lines, pipelines, tunnels and technical trenches running along or across roads.
4. *Road work maintenance process* means a document providing for the contents, methods and order for maintaining a road work. This process covers maintenance of parts and structures of a work and maintenance of installed equipment and equipment operation.
5. *Regular maintenance* means technical manipulations conducted regularly to prevent and promptly repair minor breakdowns of work parts or equipment.

Regular maintenance aims to minimize the development of minor breakdowns into major breakdowns and shall be conducted regularly and continuously on a daily basis and all year round on the whole road route to ensure safe, smooth and convenient road transport.

6. *Work maintenance* means a combination of activities aiming to maintain normal operation and ensure use safety for a work.

Road maintenance covers regular maintenance, periodical repair and irregular repair.

Periodical repair covers medium repair and overhaul.

7. *Medium repair* means the repair of breakdowns and a degraded work or structure of a work which may affect a road's operation quality and cause unsafe operation.

8. *Overhaul* means the repair conducted upon the occurrence of breakdowns or degradations in different parts of a work to restore its original quality.

9. *Irregular repair* means the repair of a road work affected by unexpected impacts such as gale, flood, earthquake, bumping, fire or others, leading to breakdowns or degradations which need timely repair to ensure uninterrupted traffic.

#### **Article 4. Road administration and maintenance requirements**

1. A road which is completely built, upgraded, renovated or has gone through overhaul or medium repair shall be checked before acceptance, handed over, administered and maintained. The administration and maintenance period is counted from the date an investor or operation manager signs the record of check before acceptance, handover and commissioning of a work.

2. Road administration and maintenance comply with the maintenance process, technical standards and administration and maintenance norms announced by competent authorities.

3. Road maintenance process

a/ For projects to build, upgrade or renovate roads with new technologies and materials; projects involving the transfer of new technologies for roads of grade II or higher grade, the designer or technical equipment supplier shall develop a maintenance process and provide it together with the work completion dossier to the road administration agency or road maintainer or operator. Expenses for developing a road maintenance process shall be included in a project's total investment.

For a project involving the transfer of operation management technologies, training shall be completed before it is handed over.

For a project involving the supply of equipment, the equipment supplier shall provide the operation and preservation technology process and regulations on labor safety and fire and explosion prevention and fighting.

b/ For road works not specified at Point a. Clause 3 of this Article, organizations and individuals may administer and maintain them according to current technical standards and regulations.

c/ For works invested in the form of build-operate-transfer (BOT). build-transfer-operate (BTO) or build-transfer (BOT). investors shall, based on the size of works specified at Point a. Clause 3 of this Article, develop a maintenance process and send such BOT. BTO or B' project contracts to competent state agencies for signing and performance.

4. A road maintainer shall fully meet safety, sanitation and environmental requirements. Specifically, he/she/it shall:

a/ Obtain a construction license and have a traffic assurance plan approved by a competent road administration agency: take measures, work out an implementation schedule, arrange time and rationally organize construction with sufficient road signs, traffic light signals, flow and lane division guidance and traffic instructors to ensure traffic safely and smoothness for people and vehicles;

b/ Implement regulations on environmental protection and labor safety in the course of construction.

5. Maintenance of works after acceptance and handover to operation managers (road administration agencies) must be warranted for 12 (twelve) months, for periodical repair, or must follow 2 steps specified in Clauses 3 and 4. Article 6 of this Circular. Regular maintenance must ensure the efficiency and safety of works according to technical standards.

## **Chapter II**

### **ROAD ADMINISTRATION AND MAINTENANCE**

#### **Article 5. Contents of road administration**

1. Preserving and managing dossiers of completion of newly built, upgraded, renovated or periodically or irregularly repaired road works.

2. Making dossiers of road work administration

a/For land bridges: Such a dossier comprises documents extracted from the work completion dossier, such as the bridge's non-load status, dossier of the height point system, plan, the bridges vertical and horizontal sections, geological section, dossier of compensation for ground clearance, dossier of road landmarks, the bridge's safety corridor, inspection dossier, and construction licensing dossier: the bridge's record, updated examination and inspection results, and periodical or irregular repair projects; and the bridge patrol and examination book:

b/ For roads: Such a dossier comprises documents extracted from the work completion dossier, such as plan, vertical and horizontal sections, geological section, water drainage system, dossier of compensation for ground clearance, dossier of road landmarks, and construction licensing dossier; the stretching plan and updated developments of traffic organization and use of land for roads: road patrol book; updated data of vehicle count (traffic flow and vehicular weight): updated examination results, and periodical or irregular repair projects;

c/ For ferry landings: Such a dossier comprises documents extracted from the work completion dossier, such as plan, including plan on the location of marking buoys and waterway traffic light signals in ferry landings, traffic organization, the ferry landing's vertical and horizontal sections, dossier of compensation for ground clearance, dossier of road landmarks, the ferry landing's safety corridor, and construction licensing dossier; updated developments of flows of ferry landing-using people and vehicles; changes in traffic organization, examination results, and periodical or irregular repair projects;

d/ For road tunnels: Such a dossier shall be made like that for roads. In addition, it must contain updated information on the status of air ventilators and air ventilation chambers, fire and explosion incidents, operation of electrostatic dust suction chambers, lighting system,



water pump system, water drainage system, wastewater treatment system, fire prevention and fighting system and other supporting equipment:

e/ For embankments, culverts and similar man-made works, separate examination and monitoring plans must be worked out in addition to regular administration and maintenance.

### 3. Making dossiers of road safety corridor administration

a/ A road safety corridor administration dossier covers the use status of road safety corridor land and works affecting road or traffic safety: violations, time of violation and handling of violations;

b/ A feeder road connection dossier must be made to monitor and additionally update violations related to such connection as a basis for working with competent authorities and local administrations to ensure road traffic safety;

c/ A technical infrastructure administration dossier comprises the dossier of completion of technical infrastructure facilities within the road safety corridor, the construction license and other relevant documents.

4. Administering and protecting road works: coordinating with police offices and People's Committees at all levels in administering and protecting road traffic infrastructure.

5. Monitoring damage of road works: conducting regular patrol and examination to promptly detect breakdowns and acts encroaching road traffic infrastructure and handle such acts according to competence or propose People's Committees at different levels to handle such acts under regulations.

6. Conducting monthly, quarterly and annual examination of technical status and irregular examination in the wake of floods or storms or other extraordinary impacts.

7. Counting vehicles, analyzing data and evaluating the growth in the flow and types of road motor vehicles.

8. Administering vehicle weights and sizes: issuing operation permits for caterpillars and oversized or overweighted vehicles exceeding the load of road works; weighing vehicles at fixed or temporary vehicle weight checkpoints or handling violations under regulations; analyzing and evaluating impacts of the operation of oversized or overweighted vehicles on the durability of road works.

9. Keeping books to monitor the number of accidents and identify initial causes of accidents and damage. (Coordinating with police offices and local administrations in tackling traffic accidents according to competence.

10. Dividing traffic lanes and flows and organizing traffic; regularly reviewing and adjusting road signal systems as appropriate; making dossiers of traffic black spots, handling these black spots and monitoring handling results.

11. Keeping watch to ensure traffic safety: updating information on weather conditions. Hoods and work incidents, handling incidents and reporting under regulations;

12. Making periodical or irregular reports under regulations.

## **Article 6. Contents of road maintenance**

1. Road maintenance covers regular maintenance, periodical repair and irregular repair.

2. Regular maintenance means routine, weekly, monthly or quarterly activities to monitor the road state, propose damage prevention solutions, promptly repair minor breakdowns affecting road quality and maintain normal operation of roads to ensure safe and uninterrupted traffic.

3. Periodical repair means the repair of road breakdowns within a specified duration in combination with the handling of road flaws emerging in the course of operation to restore the original technical status and improve operation conditions of roads (when necessary).

Periodical repair covers medium repair and overhaul. At least one medium repair must be conducted in the interval of two overhauls.

a/ For roads:

The road medium repair and overhaul period is specified based on the type of structure of road surface and the vehicular flow calculated based on road surface designs as specified in the table below:

4. Irregular repair means the repair of road breakdown incidents caused by natural disasters, floods, storms or other incidents. Concerned road administration units shall take the initiative in working out plans and expeditiously mobilizing all available human resources, equipment and supplies to divide traffic flows for ensuring smooth traffic and immediately report such to road administration agencies for assistance.

No.	Type of structure of road surface	Medium repair period (year)	Overhaul period (year)
1	Asphalt concrete	4	12
2	Cement concrete	8	24
3	Asphalt -mixed macadam and black macadam	3	9
4	Bitumin-pregnated; and asphalt-coated with 2-3 layers	3	6
5	Standard macadam, macadam-mixed	2	4
6	Naturally-mixed	1	3

The road medium repair and overhaul periods may be adjusted using coefficients to suit the road use duration and the growth in the flow of road motor vehicles. These coefficients are applied similarly as coefficients (K ) and (K,) in the appendices of regular road maintenance norms.

b/ For land bridges:

- For makeshift bridges: Periodical repair must be based on regular examination results.

- For other bridges: Periodical repair must be based on regular examination results and inspection results.

c/ For road tunnels and ferry landings: Periodical repair must be conducted based on regular examination results, in addition to repair conducted according to the operation process under regulations.

Irregular repair takes the following two steps:

a/ Step 1: Urgently repairing and restoring roads to ensure the quickest opening of roads to traffic and limit damage to road works. In this step, repairing shall be conducted simultaneously with making dossiers as a basis for payment and finalization of expenses.

b/ Step 2: Following step 1, this step aims to restore roads to the original size and technical standards or strengthen or consolidate road works. This step is taken according to the order and procedures like those for capital construction works.

#### **Article 7. Application of technical standards and norms for road administration and maintenance**

1. The Vietnam Road Administration shall formulate, appraise and announce basic technical standards on regular road maintenance.

The Vietnam Road Administration shall guide, supervise and examine the application of standards, technical regulations and norms of regular road maintenance nationwide: monitor and evaluate the application of standards, technical regulations and norms of regular road maintenance: the conversion of branch standards into national standards or regulations on regular road maintenance (including that of rural roads); and work out norms of regular road maintenance and submit them to competent authorities for announcement under regulations.

2. Technical standards and norms of periodical or irregular road repair are the same as those for capital construction works.

3. Technical standards and norms of regular road maintenance

a/ To comply with current standards and technical standards on regular road maintenance.

b/ To comply with norms of regular road maintenance.

c/ Norms of renovation and maintenance of lawns, greeneries, lighting systems and marker posts and other similar norms not mentioned at Point b. Clause 3 of this Article comply with corresponding norms promulgated by competent authorities and applicable in other sectors or localities.

#### **Article 8. Road administration and maintenance responsibilities**

1. Responsibilities of organizations and individuals for road administration and maintenance:

a/ To administer and maintain roads under Article 4 of this Circular:

b/ To detect and promptly prevent and handle acts encroaching upon road works or illegally using land reserved for roads;

c/ To take responsibility for the degraded quality of road works due to failure to follow the prescribed maintenance process.

2. National highway system

The Vietnam Road Administration shall organize the administration and maintenance of national highways; preserve, and manage the use of, dossiers of completion of newly built, upgraded or renovated road works; summarize and report to the Ministry of Transport on the administration and maintenance of national highways before January 15 every year or upon request.

3. Local road system

a/ Provincial-level People's Committees shall, through provincial-level Transport Departments, organize the administration and maintenance of provincial and urban roads:

b/ Provincial-level People's Committees shall specify the administration and maintenance of district and communal roads suitable to local conditions. Provincial-level Transport Departments shall guide and examine the administration and maintenance of local roads;

c/ Provincial-level Transport Departments shall review and send periodical or extraordinary reports on administration and maintenance of local roads and national highways entrusted to them for administration to the Vietnam Road Administration and the Ministry of Transport.

4. Investors shall manage and maintain specialized roads, roads managed and operated by entities other than the State and roads built with capital other than state budget capital according to announced national standards and technical regulations.

5. When renovating or upgrading a road under operation, the project investor shall direct the constructor in taking traffic safety assurance measures under regulations.

6. The Vietnam Road Administration shall assist the Minister of Transport in guiding, examining and supervising localities and investors in road administration and maintenance operations.

The Vietnam Road Administration shall, based on administration and information provision requirements, build a road database and specify forms of statistics and reports on road administration and maintenance.

### **Chapter III**

#### **IMPLEMENTATION PROVISIONS**

##### **Article 9. Effect**

This Circular takes effect 45 days from the date of its signing.

##### **Article 10. Organization of implementation**

1. The Chief of the Ministry Office, the Ministry's Chief Inspector, directors of departments, chairpersons of provincial-level People's Committees, the director of the Vietnam Road Administration, heads of concerned agencies and organizations, and concerned individuals shall implement this Circular.

2. Any problems arising in the course of implementation should be reported to the Vietnam Road Administration for summarization and further submission to the Ministry of Transport for consideration and settlement.-

**MINISTER OF TRANSPORT**

**Ho Nghia Dung**

**3.6 No. 11/2010/ND-CP (DECREE): PRESCRIPT THE MANAGEMENT AND PROTECTION OF ROAD INFRASTRUCTURE FACILITIES**

**THE GOVERNMENT**

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No. 11/2010/ND-CP

**SOCIALIST REPUBLIC OF VIET NAM**

**Independence - Freedom - Happiness**

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*Hanoi, February 24, 2010*

**DECREE**

**PRESCRIPT THE MANAGEMENT AND PROTECTION OF ROAD INFRASTRUCTURE FACILITIES**

**THE GOVERNMENT**

*Pursuant to the December 25, 2001 Law on Organization of the Government;  
Pursuant to the November 13, 2008 Law on Road Traffic;  
At the proposal of the Minister of Transport,*

**DECREES:**

**Chapter I**

**GENERAL PROVISIONS**

**Article 1.** Scope of regulation

This Decree details a number of articles of the Law on Road Traffic regarding management and protection of road infrastructure facilities, covering naming and numbering of roads; planning of road infrastructure facilities and technical standards; appraisal of traffic safety; protection of road infrastructure facilities; use and exploitation of land areas reserved for roads; and responsibilities for managing and protecting road infrastructure facilities.

**Article 2.** Subjects of application

This Decree applies to domestic and foreign agencies, organizations and individuals involved in managing and protecting road infrastructure facilities in Vietnamese territory.

**Chapter II**

**NAMING OR NUMBERING OF ROADS**

**Article 3.** Principles on naming or numbering of roads

1. Every road shall be given a name or number.

2. Newly built roads shall be named or numbered under this Decree, which aims to create favorable conditions for road users and road administration.

3. A national highway or an expressway must have its starting point and ending point located in the North-South or East-West direction or run from Hanoi capital or Ho Chi Minh City to the administrative centers of provinces and/or centrally run cities.

A provincial or district road must have its starting point and ending point identified in the directions like national highways or run from the administrative center of a province to the towns and/or townships or from a national highway to the administrative center of a province, district, town or township.

4. No change shall be made to roads with their names or numbers and starting points and ending points determined before the effective date of this Decree.

#### **Article 4.** Naming or numbering of roads

##### 1. Naming or numbering of roads outside urban centers

a/ A road name consists of "duong" (Vietnamese for road) followed by the name given under Point a. Clause 1, Article 40 of the Law on Road Traffic;

b/ A road number consists of a road system's abbreviations followed by a dot and ordinal numbers;

Abbreviations of road systems are as follows: QL for quoc lo (national highway), CT for duong cao toe (expressway), DT for duong tinh (provincial road) and DH for duong huyen (district road).

The Ministry of Transport shall prescribe ordinal numbers for different localities to be included in numbers given to their provincial road systems.

In case of giving numbers to many expressways, national highways or provincial or district roads or roads in the same locality, each number shall be added with a letter from B to Z, except for that of the first road given that number.

c/ In case of division of a province, if an existing provincial road runs through two new provinces, or in case of consolidation of two or more provinces, if an existing provincial road runs through the new province, the name or number, starting point and ending point of that road shall be kept unchanged;

d/ A section of several roads overlapping shall be given a name or number as follows:

- If it belongs to the same road system, it shall be given a name or number of the road of the highest technical grade;

- If it belongs to different road systems, it shall be given a name or a number of the road of the road system with the highest management level.

e/ Names and numbers of roads of road networks classified under treaties must consist of both domestic names and numbers and those given under relevant treaties.

f/ The name of a commune road must consist of only the word "Duong" (road) followed by the place name or an appellation according to local practice.

## 2. Naming or numbering of urban roads

a/ The number of an urban road consists of abbreviations of the system of "duong do thi" (DDT) followed by a dot and ordinal numbers;

b/ Urban roads shall be named under the Government's Decree No. 91/2005/ND-CP of July 11, 2005, promulgating the Regulation on naming and renaming of roads, streets and public works.

In case an urban road overlaps a section of a national highway, both the urban road name and the national highway name and number shall be used.

### Competence to name or number roads

a/ The Ministry of Transport shall give names or numbers to national highways.

b/ Provincial-level People's Committees shall give numbers to urban roads and provincial roads; give names or numbers to district roads;

Provincial-level People's Councils shall give names to urban roads and provincial roads at the request of People's Committees of the same level;

c/ District-level People's Committees shall give names to commune roads.

5. Agencies, organizations and individuals that give names and numbers of roads according to their respective competence shall announce these names and numbers in the mass media.

## **Chapter III**

### **ROAD INFRASTRUCTURE PLANNING AND ROAD TECHNICAL STANDARDS**

#### **Article 5. Principles for road infrastructure planning**

1. Compliance with socio-economic development orientations, transport planning and other relevant plannings.

2. Planning for at least 10 years and setting forth development orientations for at least 10 subsequent years.

3. A planned national highway or provincial road running through an urban center shall be built as a belt road outside the urban center, an overhead road or an underground road.



4. A road infrastructure plan for an urban center must assure a land fund specified in Article 8 of this Decree and cover access roads, flyovers and road tunnels in appropriate positions in order to assure traffic safety.

**Article 6.** Contents of a road infrastructure plan

1. Road infrastructure planning covers plan of networks of expressways, national highways, inter-regional, regional and provincial roads and planning of separate road works to meet management requirements of competent authorities.

2. Contents of a road infrastructure plan include:

a/ Analysis and assessment of present conditions:

b/ Role and position:

c/ Viewpoints and objectives;

d/ Forecast demands;

e/ Grounds for planning options:

f/ Land use needs;

g/ List of prioritized works and implementation schedule;

h/ Environmental impact assessment;

i/ Solutions, mechanisms and policies;

j/ Organization of implementation.

**Article 7.** Responsibilities to elaborate and approve road infrastructure plans

1. The Ministry of Transport shall:

a/ Elaborate plans on infrastructure of national highways, expressways and road networks connected to transport networks of other countries under agreements to which Vietnam is a contracting party, inter-regional and regional roads, and other plans as assigned, then submit them to the Prime Minister for approval under regulations;

b/ Give its written opinions on road infrastructure plans of provinces and centrally run cities;

c/ Approve road infrastructure plans according to its competence or as authorized by the Prime Minister;

d/ Inspect and oversee the implementation of road infrastructure plans throughout the country.

2. Provincial-level People's Committees shall base themselves on socio-economic development, defense and security strategies and plans and relevant transport plans to organize elaboration of local road infrastructure plans and obtain approval of the following agencies before submitting those plans to competent agencies for approval:

a/ Road infrastructure plans of urban centers of special grade shall be approved in writing by the Ministry of Construction and the Ministry of Transport;

b/ Road infrastructure plans of provinces and centrally run cities other than those specified at Point a of this Clause shall be approved in writing by the Ministry of Transport.

#### **Article 8.** Land funds reserved for road infrastructure facilities

1. Land funds for road infrastructure facilities means land areas reserved for building road works identified in road infrastructure plans. Provincial-level People's Committees shall determine and manage land areas for building road infrastructure facilities under approved planning.

2. For new urban centers of the following grades, the proportion of land for urban traffic to urban construction land must be as follows:

a/ Urban centers of special grade: 24-26%;

b/ Urban centers of grade I: 23-25%;

c/ Urban centers of grade II: 21-23%;

d/ Urban centers of grade III: 18-20%;

e/ Urban centers of grade IV or V : 16-18%;

Land for urban traffic means land areas reserved for building urban traffic infrastructure facilities, excluding rivers, lakes, ponds and underground transport works.

#### **Article 9.** Technical grades of roads

1. Technical grades of roads means designed grades of roads, including expressways and roads of grades I thru VI.

2. Technical grade of a road shall be determined on the basis of its function in a transport network and its topography and designed traffic flow.

#### **Article 10.** Application of technical standards

1. Roads currently in use but not yet up to any technical grade must be renovated and upgraded to reach technical standards of an appropriate grade.

2. Newly built roads must be up to technical standards of its grade and satisfy relevant regulations on traffic organization and safe exploitation of road works.

3. Forestry roads, mining roads and other special-use roads are subject to national standards on roads and specific standards of relevant sectors.

4. In case of application of foreign road technical standards, approval of the Ministry of Transport is required.

## **Chapter IV**

### **TRAFFIC SAFETY APPRAISAL**

**Article 11.** General provisions on traffic safety appraisal

1. Competence to decide on and organize traffic safety appraisal

a/ For roads under construction, upgrading or renovation

Persons competent to decide on investment in road projects shall conduct traffic safety appraisal. Investors shall decide to select a project phase subject to traffic safety appraisal and organize traffic safety appraisal. For projects implemented under build-operate-transfer (BOT), build-transfer (BT) or build-transfer-operate (BTO) contracts, the competence to decide on traffic safety appraisal is specified at Point b of this Clause.

b/ For roads currently in use

The Ministry of Transport shall decide on and organize traffic safety appraisal for national highways and expressways;

Provincial-level People's Committees shall decide on and organize traffic safety appraisal for urban roads, provincial roads and district roads.

2. Traffic safety appraisal conducted by competent agencies specified in Clause I of this Article shall be based on traffic safety inspection reports of traffic safety inspection consultants.

3. Organizations and individuals implementing projects not funded by state capital or having special-use roads shall organize traffic safety appraisal under this Decree. Their traffic safety appraisal reports must be approved by competent state agencies specified in Clause 1 of this Article.

4. Traffic safety inspection shall be conducted by capable organizations specified in Article 12 of this Decree. Traffic safety inspection organizations must be those operating independently from design consultancy organizations which have made project dossiers and work designs.

5. Traffic safety inspection organizations shall examine project dossiers and work designs, inspect construction sites to uncover possible risks of traffic accident, and make inspection reports to propose or recommend remedial measures.

6. Design consultants shall respond to proposals and recommendations made in traffic safety inspection reports already appraised under Clause 2 of this Article for adjustment of project dossiers and designs. If disagreeing with traffic safety inspection organizations, they shall report to investors for consideration and decision.

For roads currently in use, road administration agencies shall respond to proposals and recommendations made in traffic safety inspection reports already appraised under Clause 2 of this Article and work out repair or remedy plans. If disagreeing with traffic safety inspection reports, they shall submit those reports to competent agencies specified at Point b. Clause 1 of this Article for consideration and decision.

7. Traffic safety inspection expenses and appraisal fee shall be included into work construction total investment and cost estimates, for roads under construction, upgrading or renovation; or used as a financial source for road administration and maintenance, for roads currently in use.

8. Traffic safety inspection expenses and appraisal fee

a/ The Ministry of Transport shall prescribe traffic safety inspection expenses for roads under construction, upgrading or renovation;

b/ The Ministry of Transport shall assume the prime responsibility for, and coordinate with the Ministry of Finance in, prescribing traffic safety inspection expenses for roads currently in use;

c/ The Ministry of Finance shall assume the prime responsibility for, and coordinate with the Ministry of Transport in, prescribing the traffic safety appraisal fee.

9. The Ministry of Transport shall specify traffic safety appraisal and inspection in each period and contents of training programs on traffic safety inspection, and organize training courses and issue traffic safety inspector certificates.

## **Article 12.** Conditions on traffic safety inspection organizations and individuals

1. A traffic safety inspection organization must fully satisfy the following conditions:

a/ For group-A and group-B projects, a traffic safety inspection organization must have at least 10 employees, including at least 4 road engineers, 1 road transport engineer and 1 person qualified for acting as traffic safety chief inspector;

b/ For group-C projects, a traffic safety inspection organization must have at least 5 employees, including at least 1 road engineer, 1 road transport engineer and 1 person qualified for acting as traffic safety chief inspector.

2. Traffic safety inspection individual (referred to as inspector) must satisfy the following conditions:

a/ Possessing a university degree or postgraduate degree in road traffic (road, bridge, traffic and public works, road transport) and having worked as a road work designer for at least 3 years, or possessing a postgraduate degree and having been engaged in road traffic administration for at least 5 years, and taken part in designing or directly handled traffic safety of, at least 3 works;

b/ Having a traffic safety inspector certificate issued by a competent state agency.

3. Apart from the conditions specified in Clause 2 of this Article, an individual acting as traffic safety chief inspector must also satisfy any of the following conditions:

a/ Possessing a university degree or postgraduate degree in road traffic and having worked as a road work designer for at least 10 years;

b/ Possessing a university degree or postgraduate degree and having been engaged in road traffic administration for at least 12 years and taken part in designing or directly handled traffic safety of, at least 3 works;

c/ Having acted as project chief designer for at least 3 projects on road works of a grade equivalent to the grade of works subject to traffic safety inspection (work grades comply with the construction law).

### **Article 13.** Stages of traffic safety appraisal

1. For roads under construction, upgrading or renovation

a/ Traffic safety appraisal is compulsory in the stage of technical design or construction drawing design;

b/ Apart from the provisions of Point a. Clause 1 of this Article, persons with investment-deciding competence may select traffic safety appraisal to be conducted in either of the following stages:

- Formulation of investment projects on work construction or elaboration of econo-technical reports on work construction;

- Before roads are put into use.

2. For roads currently in use, traffic safety appraisal must be conducted upon the occurrence of any of the following:

a/ Traffic accidents on a road surge in number after it is upgraded or renovated;

b/ The actual traffic flow increases over 30% compared to the level designed in the computing period;

c/ The urbanization rate increases over 20% compared to that at the time of putting the road into use.

## **Chapter V**

### **PROTECTION OF ROAD TRAFFIC INFRASTRUCTURE FACILITIES**

#### **Article 14.** Scope of land areas reserved for roads

1. The scope of land areas reserved for a road covers road land and road safety corridor land.
2. Road land means land areas on which road works are constructed and 2 land strips along both sides of roads for administration, maintenance and protection (below referred to as land strips for road protection and maintenance).

Land strips for road protection and maintenance shall be used for storing supplies to be used for road maintenance, moving or installing maintenance equipment, sweeping rubbish from road surface, and guarding against harms to road works.

The width of land strips for road protection and maintenance shall be determined based on the road grade and measured from the outer edge of the road base (the foot of embanked road taluses or the outer edge of longitudinal trenches in undug or unembanked locations or the top edge of dug road taluses) to both sides, which is:

- a/ 3 meters for expressways and grade-I and grade-II roads;
- b/ 2 meters for grade-III roads;
- c/ 1 meter for roads of grade IV or lower grades.

3. For road works under construction, upgrading or renovation, investors shall determine boundaries of land areas reserved for roads and carry out procedures for requesting competent authorities to recover these land areas and pay compensations for current users under the land law.

4. For road works currently in use, road administration agencies shall coordinate with local land administration agencies in determining boundaries of land areas reserved for roads and working out plans to recover land from current users for management under regulations, prioritizing the recovery of land areas for roads of grade III or higher grades.

#### **Article 15.** Road safety corridor limits

The road safety corridor means land strips along both sides of road land used for assuring traffic safety and protecting road works. Road safety corridor limits are prescribed as follows:

1. For roads outside urban centers: Depending on their planned technical grades, the width of a road safety corridor measuring from the road land to both sides is:

- a/ 47 meters for expressways;
- b/ 17 meters for grade-I and grade-II roads;
- c/ 13 meters for grade-III roads;
- d/ 9 meters for grade-IV and grade-V roads;
- e/ 4 meters for under grade-V roads.

2. For urban roads: The road safety corridor width shall be measured from the road edge to the road construction marking line under the planning approved by competent authorities. For an urban expressway, the width of its safety corridor is 40 meters.

3. For roads with safety corridors overlapping those of railways, the safety corridors of such roads and railways shall be demarcated on the principle that railway safety corridors will be prioritized, provided that they must not overlap road works.

In case a road and a railway are adjacent and share a longitudinal trench, the boundary between their safety corridors is the bottom edge of the trench on the higher roadside. If the heights of the two corridors are equal, the boundary between the safety corridors is the bottom edge of the trench on the railway side.

4. For roads with safety corridors overlapping protection corridors of inland waterways, the boundary of these corridors is the edge of the natural bank.

#### **Article 16.** Safety corridor limits for bridges and sluices

##### 1. Safety corridors for bridges on roads outside urban centers

a/ In the direction of the length of the bridge, the safety corridor width measuring from the bridge abutment's end outward each side is:

- 50 meters for bridges with a length of 60 m or over;
- 30 meters for bridges with a length of under 60 m.

b/ In the direction of the width of the bridge, the corridor width measuring from the outer edge of the road land outward each side is:

- 150 meters for bridges with a length of over 300 m;
- 100 meters for bridges with a length of between 60 m and 300 m;
- 50 meters for bridges with a length of between 20 m and under 60 m;
- 20 meters for bridges with a length of under 20 m.

## 2. Safety corridors for bridges on urban roads

a/ In the direction of the length of the bridge, it is the same as prescribed for bridges on roads outside urban centers.

b/ In the direction of the width of the bridge, for bridge sections over land, including those over infrequently submerged land areas, the corridor width measuring from the outer edge of the road land outward each side is 7 meters. Other bridge sections comply with provisions of Point b, Clause 1 of this Article;

c/ At urban traffic junctions, flyovers, road tunnels and footbridges shall be built according to designs approved by competent authorities.

## 3. Safety corridors for sluices correspond to safety corridors of roads where sluices are located.

### **Article 17.** Safety corridor limits for road tunnels

1. For a road tunnel outside urban centers, its safety corridor limit is the land and water area surrounding the tunnel within 100 meters measuring from the outermost point of the tunnel.

2. For an urban road tunnel, its safety corridor limit shall be determined by design consultants in the design dossier approved by a competent authority to assure the safety and solidity of the tunnel.

### **Article 18.** Safety corridor limits for ferry landings and pontoon bridges

1. In the direction of the length of the ferry landing or pontoon bridge: The safety corridor width is equal to the length of the slope leading to the ferry landing or pontoon bridge

2. In the direction of the width of the ferry landing or pontoon bridge: 150 meters from the middle of the ferry landing or pontoon bridge to both side downstream and upstream.

### **Article 19.** Safety corridor limits for road protection embankments

1. For anti-erosion embankments to protect road bases

a/ They are 50 meters from both ends of the embankment to the upper reach and lower reach;

b/ They are 20 meters from the foot of the embankment toward the river.

2. For water current-regulating embankments:

a/ They are 100 meters to the upper reach and lower reach from the embankment foot;

b/ They are 50 meters from the embankment foot to the bank;

c/ They are 20 meters from the embankment foot to the river.



3. In case the safety corridor of a road protection embankment specified in Clause 1 or 2 of this Article overlaps that of a dike, the boundary between the two corridors is the midpoint of the distance between two outermost points of the two works.

**Article 20.** Protection scopes of other works on roads

Protection scopes of car terminals, parking lots, traffic control stations, car-weighing stations, road and bridge toll booths, stopovers and road administration works are the land and water areas within the areas of these works, which are stated by competent state agencies in their land use right certificates and house and land-attached asset ownership certificates.

**Article 21.** Overhead protection clearance for newly built road works

The road safety clearance for overhead sections is prescribed as follows:

1. For a road, it is 4.75 meters measuring from the highest point of the road surface upward vertically. For an expressway, it complies with national standards.
2. For a bridge, it is the height of the highest structure of the bridge, but must not be lower than 4.75 meters from the highest point of the bridge floor surface (vehicle lane) upward vertically.
3. The height of a communications line hanging above a road must ensure the minimum vertical distance of 5.5 meters from the highest point of the road surface to such communication line.
4. The height of a power transmission line hanging above a road or directly attached to the structure of a bridge must ensure safety for transport activities and the safety of the power grid, depending on the voltage of the transmission line.

**Article 22.** Distances between road works and other works

1. Production establishments whose exhaust or dust emissions or air pollution impacts reduce visibility in affected areas must be located at a distance corresponding to these areas from the outer boundaries of road safety corridors.
2. Lime or brick kilns or similar production establishments must be located outside and at a distance of 25 meters from road safety corridors.
3. Markets and service places must have their parking lots or goods-storing places located outside road safety corridors and have junctions with roads under regulations.
4. Storehouses of explosives, highly flammable materials, toxic chemicals and mines where blasts are used must be located outside road safety corridors at a distance to prevent fire, explosion and pollution and assure safety for transport activities under law.
5. Urban centers, industrial parks, economic zones, residential areas, trade-service centers and other works, except for those specified in Clauses 1, 2, 3 and 4 of this Article, must be located

outside road safety corridors at an appropriate distance under regulations on distances between architectural and construction works.

6. Investors or users of other works outside road safety corridors which affect road traffic and road traffic safety shall promptly take remedies or make repairs.

**Article 23.** Limit horizontal road safety distance

For telecommunications antenna poles, communication lines and power transmission lines, the limit distance measuring from the foot of embanked road taluses or the top edge of dug road taluses to the pole foot must be at least 1.3 times the pole height and must not be shorter than 5 meters. Other cases shall be prescribed by the Ministry of Transport.

**Article 24.** Limit road safety distance for underground or underwater sections

Limit road safety distance for underground or underwater sections of road works shall be decided by competent road administration agencies for each specific project, satisfying technical requirements, assuring traffic safety and work safety and causing no impact on road administration and maintenance.

**Chapter VI**

**USE AND EXPLOITATION WITHIN LAND AREAS RESERVED FOR ROADS**

**Article 25.** Use of roads for cultural activities

1. Agencies and organizations wishing to use roads for cultural activities (sports events, parades, festivals) shall send their written requests and plans on traffic safety assurance to competent road administration agencies at least 10 working days before these cultural activities take place. Such a written request must clearly indicate cultural activities and program to be organized and road use duration.

2. Competent road administration agencies shall approve in writing plans on traffic safety assurance according to the following decentralization of powers:

a/ The Vietnam Road Administration shall approve cultural activities to be organized on national highways or various road systems including national highways;

b/ Provincial-level Transport Departments shall approve cultural activities to be organized on provincial roads or urban roads in their provinces or on various road systems including provincial roads and urban roads, except cases specified at Point a of this Clause;

c/ Specialized agencies of district-level People's Committees shall approve cultural activities on district roads in their districts or cultural activities to be organized concurrently on both district roads and commune roads in their districts;

d/ Commune-level People's Committees shall approve cultural activities on commune roads in their localities.

3. Competent road administration agencies shall examine and approve in writing traffic safety assurance plans within 5 working days after receiving written requests. In case of necessity to limit or ban traffic on a road, a road administration agency shall issue a notice on traffic flow division plans; agencies and organizations wishing to use roads for cultural activities shall publish notices in the mass media 5 days before cultural activities take place.

4. Upon completion of cultural activities, agencies and organizations assuming the prime responsibility for these activities shall tidy up their equipment and devices and restore roads to their original state and be held responsible for their failure to take measures to assure traffic safety set forth in approved plans.

**Article 26.** Use of land reserved for roads 1. Land reserved for roads shall be reserved only for construction of road works, used and exploited for road traffic and transport safety purposes, except for a number of essential works which cannot be located outside land areas reserved to roads.

2. Construction of a number of essential works within land areas reserved for roads must ensure safe exploitation of road works and shall be conducted in the following cases:

a/ Works to assure security and defense;

b/ Works subject to special technical requirements, which cannot be located outside land areas reserved for roads.

3. Projects on urban centers, industrial parks, economic zones, residential areas, trade-service centers and other works must be formulated according to approved planning and have their own systems of access roads outside land areas reserved for roads. Project investors shall build these access roads without using land areas reserved for auxiliary works and connecting roads. In case of necessity to use land reserved for roads for building connecting roads to national highways, connecting positions must be built as indicated in connection plans agreed upon between provincial-level People's Committees and the Ministry of Transport under Article 29 of this Decree.

4. It is prohibited to use land areas reserved for roads as residential land areas or for business or service purposes; for anchoring or mooring ships and boats or building works which might redirect water currents or cause erosion or washout of bridges, pontoon bridges, ferry landings, water current-regulating embankments and anti-road base washout embankments.

**Article 27.** Construction of essential works within land areas reserved for roads

1. Organizations and individuals building essential works within land areas reserved for roads shall comply with the following provisions:

a/ They shall formulate and approve projects and designs under the investment and construction laws.

b/ They shall obtain written consent of the following competent state management agencies upon formulation of investment projects, technical design dossiers or econo-technical reports before submitting them to competent authorities for approval:

- The Ministry of Transport, for essential works in the systems of national highways and expressways;

- Provincial-level People's Committees, for essential works in local road systems.

c/ They shall obtain traffic safety-assuring construction permits, issued by competent road administration agencies.

2. The Ministry of Transport shall specify the issuance of construction permits for essential works on or connections to national highways or expressways. Provincial-level People's Committees shall specify the issuance of construction permits for essential works on or connections to local roads.

**Article 28.** Land exploitation and use within land areas of road safety corridors

Land areas of road safety corridors may be temporarily used for agricultural or advertising purposes without affecting safety of road works and traffic in accordance with the following provisions:

1. Ponds and lakes for aquaculture must be away from the edge of the road foot at a distance at least equal to the height difference between the edge of the embanked road base and the pond or lake bed. The water level in ponds or lakes must not be higher than the road base foot.

It is prohibited to build ponds or lakes for aquaculture or reserve water on the taluses of the dug road base.

2. Food crops, vegetables, cash crops or fruit trees, which are allowed to be planted in embanked road base sections in road bends, crossroads, intersections with railways and in places with insufficient visibility, must not be over 0.9 meter in height (over the road surface). For dug roads, they must be planted at least 6 meters away from the outer edge of the road land strip.

3. Irrigation ditches must be away from the outer edge of the road land strip at a distance at least equal to their depth and their designed safe water level must not be higher than the road base foot.

4. Gas stations must be built outside road safety corridors under approved planning, and with written approval of the Ministry of Transport (for national highways and roads subject to separate management regulations) or provincial-level Peoples Committees (for provincial, district and urban roads) of locations and designs of gas station entry ways through the land of road safety corridors, including designs of junctions with existing roads, satisfying technical standards and safety requirements of road sections currently in use.

5. Billboards temporarily installed within road safety corridors must not affect traffic safety and must be approved by competent road administration agencies.

It is prohibited to install billboards within expressway safety corridors.

Billboards installed outside road safety corridors must not affect traffic safety.

6. Use of road safety corridors related to adjacent security or national defense works must be agreed by the Ministry of Public Security or the Ministry of Defense.

7. Works may be built on road safety corridor land only after competent road administration agencies issue construction permits and traffic safety is assured under regulations.

8. Investors of works involving land use or exploitation within the protection scope of road infrastructure facilities shall:

a/ Complete all procedures for agreeing on or approving designs (basic designs, technical designs or working drawing designs, depending on the size and characteristics of construction works, below referred to as designs), appraise designs (when necessary) and issue construction permits under this Decree and other relevant regulations;

b/ Undertake to remove or renovate their works according to schedule as required by competent road administration agencies;

c/ Refrain from claiming for compensations and bear total responsibility and related expenses.

9. Works on road safety corridor land that are built before regulations on administration of road safety corridors take effect and used for proper purposes indicated in land use right certificates or house or land-attached asset ownership certificates issued by competent agencies and do not affect traffic safety may be further used.

Upon receiving requests for recovery of land for upgrading or renovation of traffic works, upgrading or renovation investors shall pay compensations or provide supports for owners of dismantled works under law.

## **Article 29.** Connection to national highways

1. Roads to be connected to national highways include:

a/ Provincial, district, commune and urban roads;

b/ Special-use roads;

c/ Access roads.

2. Branch roads must be connected to national highways through junctions under junction plans approved by provincial-level People's Committees, after obtaining written consent of the Ministry of Transport. Road administration state agencies in charge of under provincial-

level People's Committees shall make statistics of connected roads and work out handling plans in line with approved junction plans.

Passageways from houses may only be connected to national highways through branch roads.

3. The minimum distance between two junctions on national highways shall be prescribed by the Minister of Transport.

4. The designing of junctions of branch roads and national highways must comply with national standards on motorways.

5. For junctions of branch roads and national highways which are under construction, upgrading, renovation or route redirection, or building of detour sections: Right in the stage of project formulation, project investors shall base themselves on socio-economic development master plans of localities through which projected roads will run to determine locations and sizes of junctions (interchanges or level junctions).

6. For junctions of branch roads and national highways currently in use: Provincial-level People's Committees shall base themselves on local socio-economic development needs and transport development plans to elaborate junction plans.

7. Owners of works and projects that are assigned by provincial-level People's Committees to use junctions under approved junction plans shall base themselves on current standards and design requirements of motorways to make and send dossiers of junction designs and plans on organization of traffic at junctions on national highways to competent agencies for consideration and approval.

#### **Article 30.** Construction of works on roads currently in use

1. Construction of works on roads currently in use or essential works within land areas reserved for roads must assure safe and uninterrupted traffic by people and vehicles, durability of road works currently in use, and environmental protection.

2. Construction of works on roads currently in use must comply with the Minister of Transport's regulations on traffic safety assurance.

### **Chapter VII**

#### **RESPONSIBILITIES TO MANAGE AND PROTECT ROAD INFRASTRUCTURE FACILITIES**

#### **Article 31.** Responsibilities of the Ministry of Transport

1. To perform the unified state management of roads nationwide; to manage the construction and maintenance of the national highway system, roads partly used for international transport and expressways (including also national highways and expressways running through urban centers).

2. To submit to the Government for promulgation or promulgate according to its competence legal documents on management and protection of road infrastructure facilities, and guide the implementation thereof;

3. To direct and organize the training and retraining of personnel in charge of administration and protection of centrally managed road works; to guide provincial-level People's Committees in organizing refresher courses for their cadres engaged in administration and protection of locally managed road works.

4. To examine and inspect the implementation of legal provisions on administration and protection of road infrastructure facilities.

5. To organize, direct and supervise activities of the Road Inspectorate nationwide.

6. To work out plans on the prevention, combat and overcoming of damage of national highway works caused by natural disasters or enemy sabotage, and organize and inspect the implementation thereof; to urge and inspect the prevention, combat and overcoming of damage of local roads caused by natural disasters or enemy sabotage.

7. To coordinate with provincial-level People's Committees and concerned ministries and branches in propagating, disseminating, educating and implementing laws and regulations on administration and protection of road infrastructure facilities.

8. To coordinate with the Ministry of Finance in balancing funds for road administration and maintenance, clearance of road safety corridors, prevention, combat and overcoming of consequences of natural disasters and enemy sabotage against the national highway system.

9. To coordinate with the National Traffic Safety Committee and concerned ministries and branches in formulating the national traffic safety program, then submitting it to the Government.

#### **Article 32.** Responsibilities of the Ministry of Public Security

1. To direct and guide public security forces to inspect and handle violations of regulations on protection of road infrastructure facilities according to their competence.

2. To coordinate with the Ministry of Transport and provincial-level People's Committees in performing the state management of protection of road infrastructure facilities.

3. To coordinate with the Ministry of Transport in drawing up a list of important road works and plans for the protection thereof, then submit them to the Prime Minister for approval, and organize the implementation thereof.

#### **Article 33.** Responsibilities of the Ministry of National Defense

The Ministry of National Defense shall assume the prime responsibility for, and coordinate with the Ministry of Transport in. organizing the protection of national defense works in combination with road works.

**Article 34. Responsibilities of the Ministry of Agriculture and Rural Development**

The Ministry of Agriculture and Rural Development shall direct and guide the planning and construction of the system of irrigation works related to road works; guide the use of land within road safety corridors for cultivation purposes, ensuring road work technical requirements and safety.

**Article 35. Responsibilities of the Ministry of Natural Resources and Environment**

The Ministry of Natural Resources and Environment shall assume the prime responsibility for, and coordinate with provincial-level People's Committees and the Ministry of Transport in, guiding the elaboration of plans on use of land reserved for roads and regulations on environmental protection against road traffic impacts.

**Article 36. Responsibilities of the Ministry of Construction**

The Ministry of Construction shall direct and guide the management of construction activities outside road safety corridors; and coordinate with the Ministry of Transport and provincial-level People's Committees in elaborating and implementing urban traffic infrastructure plans.

**Article 37. Responsibilities of the Ministry of Industry and Trade**

The Ministry of Industry and Trade shall direct and guide the planning and construction of the system of gas stations along national highways and roads subject to separate use regulations; and coordinate with the Ministry of Transport in determining locations of these gas stations' entry ways to national highways, assuring the minimum distance under regulations on connection of branch roads to national highways.

**Article 38. Responsibilities of the Ministry of Finance**

The Ministry of Finance shall assume the prime responsibility for, and coordinate with the Ministry of Transport and provincial-level People's Committees in, summing up and allocating funds for road administration and maintenance and road infrastructure protection, including funds for clearance of road safety corridors allocated from the state budget's non-business expenditure source or originate from the state budget.

**Article 39. Responsibilities of ministries and ministerial-level agencies**

Ministries and ministerial-level agencies shall appraise and approve plans on construction of works, industrial parks, urban centers, residential areas, trade-service centers and gas stations related to land areas reserved for roads in accordance with this Decree; and supervise the implementation of these plans and handle violations under regulations.

**Article 40. Responsibilities of provincial-level People's Committees**

1. To organize and guide the propaganda and dissemination of and education about the law on protection of road infrastructure facilities in their localities.



2. To guide and organize the implementation of regulations on protection of road infrastructure facilities in their localities.
3. To direct and inspect district-level People's Committees and provincial-level Transport Departments in taking measures to prevent, stop and handle violations and remove works encroaching upon road safety corridors in their localities.
4. To organize, direct and inspect provincial-level Transport Departments in:
  - a/ Operations of the Road Inspectorate;
  - b/ Issuance and revocation of construction permits, termination of activities affecting the safety of traffic and road works within local road infrastructure protection limits;
  - c/ Management of the implementation of road infrastructure plans; administration and maintenance of local road systems.
5. To direct, guide and inspect district-level People's Committees in:
  - a/ Protection of road works in their districts;
  - b/ Management of the use of land inside and outside road safety corridors, especially land allocation and issuance of permits for roadside construction;
  - c/ Clearance of works encroaching upon protected road infrastructure facilities within their districts.
6. To mobilize forces, supplies and equipment for the prompt restoration of traffic disrupted by national disasters or enemy sabotage.
7. To plan and direct the application of measures to prevent, stop and handle violations and clear road safety corridors in their localities.
8. To appraise and approve plans on construction of works, industrial parks, urban centers, residential areas, trade-service centers and gas stations related to land areas reserved for roads in accordance with this Decree; and supervise the implementation of these plans and handle violations under regulations.
9. To settle disputes, complaints and denunciations related to the protection of road infrastructure facilities in their localities under law.

**Article 41.** Responsibilities of district-level People's Committees

1. To manage and maintain local road systems assigned to them for management.
2. To organize the propagation, dissemination and education among local people of regulations on land areas reserved for roads and protection of road infrastructure facilities.

3. To manage the use of land inside and outside road safety corridors under law; to promptly handle cases of illegally encroaching upon, appropriating or using land of road safety corridors.
4. To coordinate with road administration units and concerned forces in applying measures to protect road works.
5. To organize the application of measures to protect road safety corridors, fight illegal encroachment, and compel the dismantlement of illegally built works for clearance of road safety corridors.
6. To mobilize all forces, supplies and equipment for protection of works or prompt restoration of traffic disrupted by natural disasters or enemy sabotage.
7. To settle disputes, complaints and denunciations related to the protection of road infrastructure facilities in their districts under law.

**Article 42.** Responsibilities of commune-level People's Committees

1. To manage and maintain local roads assigned to them for management.
2. To organize the propagation, dissemination and education among local people of regulations on land areas reserved for roads and protection of road infrastructure facilities.
3. To coordinate with units directly managing road works and concerned forces in applying measures to protect road works, including preservation of road boundary markers and project ground clearance markers.
4. To manage the use of land inside and outside road safety corridors under law; detect and promptly handle cases of illegally encroaching upon, appropriating or using road safety corridors.
5. To mobilize all forces, supplies and equipment for protection of works or prompt restoration of traffic disrupted by natural disasters or enemy sabotage.
6. To settle disputes, complaints and denunciations related to the protection of road infrastructure facilities under their management according to law.

**Article 43.** Identification of periods of time for handling works existing within land areas reserved for roads

1. Before December 21, 1982: There was no regulation on works existing within land areas reserved for roads.
2. Between December 21, 1982, and before January 1, 2000, the effective period of Decree No. 203/HDBT of December 21, 1982, of the Council of Ministers, on the Regulation on road protection.

3. Between January 1, 2000, and before November 30, 2004, the effective period of the Government's Decree No.172/1999/ND-CP of December 7, 1999, detailing the Ordinance on Protection of Traffic Works regarding road traffic works.

4. Between November 30, 2004, and before the effective date of this Decree: the effective period of the Government's Decree No. 186/2004/ND-CP of November 5, 2004, on management and protection of road infrastructure facilities.

**Article 44.** Handling of works existing within land areas reserved for roads

1. Works endangering the stability of road works and safety of road transport activities must be immediately dismantled.

2. Works which are considered not directly affecting the stability of road works and road traffic safety shall, for the immediate future, be permitted to exist in their original state, provided that their owners commit not to expand and develop them, and to dismantle them when so requested by competent state management agencies.

3. Compensations or supports for owners of dismantled works shall be paid or provided under law.

**Article 45.** Coordinated protection of road infrastructure facilities

1. The Ministry of Transport shall promulgate legal documents guiding the use of land areas reserved for roads and protection of road infrastructure facilities, or assume the prime responsibility for, and coordinate with concerned ministries and branches in doing so.

2. The Ministry of Transport shall assume the prime responsibility for, and coordinate with the Ministry of Public Security in working out plans on examination and inspection of the protection of road infrastructure facilities in localities, and urging localities to handle violations and illegal construction of works within road safety corridors.

3. Ministries and branches shall, within their respective functions, tasks and responsibilities defined in the Law on Road Traffic and this Decree, protect road infrastructure facilities.

4. Provincial-level People's Committees shall direct district-level and commune-level People's Committees and provincial-level Transport Departments in working out plans on and coordinating with road administration units in protecting road infrastructure facilities; handling violations of regulations on use of road safety corridor land; directing specialized agencies in overseeing and summarizing the use of land areas reserved for roads and reporting it to the Ministry of Transport and the Vietnam Road Administration.

5. When planning or implementing projects related to road infrastructure facilities, ministries and branches shall obtain written consent of the Ministry of Transport right in the stage of project formulation, and direct and guide investors, designing and construction contractors in using land areas reserved for roads and assuring traffic safety during construction under the Law on Road Traffic and this Decree.

## **Chapter VIII**

### **IMPLEMENTATION PROVISIONS**

#### **Article 46.** Effect and implementation guidance

1. This Decree takes effect on April 15, 2010, and replaces the Government's Decree No. 186/2004/ND-CP of November 5, 2004, on management and protection of road infrastructure facilities.
2. The Minister of Transport shall guide the implementation of Articles 4, 11, 27, 28, 29 and 30, and guide other necessary provisions, of this Decree.
3. Ministers, heads of ministerial-level agencies and government-attached agencies, and chairpersons of provincial-level People's Committees shall implement this Decree-On behalf of the Government

**PRIME MINISTER**

**Nguyen Tan Dung**

**3.7 No: 07/2010/TT-BGTVT (CIRCULAR): REGULATIONS ON THE LOADING CAPACITY, LIMIT OF ROADS; CIRCULATION OF OVERSIZED, OVERLOADED VEHICLES AND CATERPILLARS; TRANSPORTATION OF EXTRA-LONG AND EXTRA-HEAVY CARGOES; AND CARGOES LOADING LIMITS OF ROAD VEHICLES IN ROAD TRAFFIC**

No: 07/2010/TT-BGTVT

Hanoi, February 11<sup>th</sup> 2010

### **Circular**

## **REGULATIONS ON THE LOADING CAPACITY, LIMIT OF ROADS; CIRCULATION OF OVERSIZED, OVERLOADED VEHICLES AND CATERPILLARS; TRANSPORTATION OF EXTRA-LONG AND EXTRA-HEAVY CARGOES; AND CARGOES LOADING LIMITS OF ROAD VEHICLES IN ROAD TRAFFIC**

*Persuant to Law on road traffic dated November 13<sup>th</sup> 2008;*

*Persuant to Decree No 51/2008/ND-Cp dated April 22<sup>nd</sup> 2008 by Government on functions, duties, organization of Ministry of Transport;*

*Minister of Transport regulations on loading capacity, limit of roads, disclosure load, limit of highway, circulation of oversized, overload vehicles and caterpillars; transportation of extra-long and extra-heavy cargoes; and cargoes loading limits of road vehicles for road traffic.*

### **Chapter 1.**

#### **GENERAL PROVISIONS**

##### **Article 1. Scope**

This circular defines the regulations of loading capacity, limit of roads, disclosing the load, limit of highway, the circulation of oversized, overload vehicles and caterpillars; transportation of extra-long and extra-heavy cargoes; and and the limit of cargo loading on vehicles in road traffic.

##### **Article 2. Application Objects**

This circular applies to organizations, individuals related to disclosing of loading capacity, limit of roads, published load, limit of highway, the circulation of oversized, overload vehicles and caterpillars; transportation of extra-long and extra-heavy cargoes; and the limit of cargo loading on vehicles in road traffic.

##### **Article 3. Definitions**

This circular, the terms below are construed as follows:

1. The total weight of vehicle includes the body weight and the weight of cargoes loaded on vehicle (if any)

2. Axle load is total weight of vehicle distributed on each axle (single-axle, bi-axle set, tri-axle set)

3. Maximum size allowed for road vehicle is limit on the width, height, length of vehicle's outer cover including goods loaded on vehicle (if any) are allowed to join in road traffic.

4. Caterpillar is specialized self – propelled vehicle moved by sprocket-wheel, sprocket can damage road, roadside when moving on road.

5. Combination vehicles with trailers or semi-trailer is a vehicle pulling a trailer or a vehicle combination with a tractor semi-trailers.

6. Goods can not be disassembled (split) is parcel loaded, sealed by Customs, Security, Defence Agency or component combination, equipment, machine will be damaged or functional changed when being split.

7. Vehicle owners are organization, individual on behalf of registration.

## **Chapter 2.**

### **REGULATION ON THE LOADING CAPACITY, LIMIT SIZE OF ROADS; DISCLOSURE LOADING CAPACITY AND LIMIT SIZE OF NATIONAL ROADS**

#### **Article 4. Loading capacity of roads**

1. Loading capacity of road is capable of bridges and roads carrying to ensure longevity as designed.

2. Loading capacity of bridge is determined according to design documents and existing technical conditions of bridge, published by authorities or shown by sign “limited weight”

3. Loading capacity of road is determined according to design documents and existing technical conditions of road, published by authorities or shown by sign “weight restriction on axle”

#### **Article 5. Limit of roads**

1. Limit of road is space limited on height, width of roads, bridges, ferries, tunnels for vehicles including goods loaded on vehicles go through safely.

2. Limit of road on height is 4,75 meter for highway, road level I, II, III; 4,5 meter for road level IV or downwards.

3. Limit of road on width is limit of width lane, depends on technical level of road and terrain.

#### **Article 6. Disclosure loading capacity and limit of national highway**

1. Disclosure loading capacity on new upgraded and renovated alignments, national highway sections with synchronous load capacity designed for road for single - axle trucks conventional 10ton/axle, load capacity design of bridge is load truck train patterned after load diagram H30-XB80 or load HL93 in Appendix 1a attached this Circular.

2. Disclosure limit of national highway depends on technical level of road and terrain in Appendix 1b attached this Circular and alignments, national highway sections in Appendix 1a.

3. Road management agencies have to organize to settle load limit and real limit of bridge sign on bridges which on alignments, national highway sections listed in Appendix 1a hasn't been renovated, upgraded synchronous load suitable with load and limit published in term 1 and term 2 this Article.

#### **Article 7. Adjust loading capacity and limit size of national roads**

Directorate for roads of Vietnam is responsible for updating the alignments, new upgraded and renovated national highway sections, degraded alignments due to damaged pavement or national road construction technology condition does not guarantee to publish the addition or adjustment of loading capacity, national road size limit which was announced in Term 1 and 2 of Article 6 of this Circular.

#### **Article 8. Circulation of road vehicles**

1. Road motorized vehicle meet road conditions at payload size limits of road have been announced and the regulations of cargoes limit in Article 16, Article 17 and Article 18 of this Circular are allowed to circulate on the alignments, national highway sections defined on Annex 1a.

When road motorized vehicle crossing the bridge with weight limit sign, the actual size limits of the bridge under the regulations of Term 3 of Article 6 of this Circular, have to abide weight limit sign, the actual size limit of bridge, speed and safe distance between vehicles.

2. On the unlisted alignments, road sections in Appendix 1a vehicle owners, hirers and drivers must comply with local roads regulations on weight, limit of road published by People's committee of the provinces and cities under central or "limited weight", limit of road, speed, distance signs and the regulations on cargoes loading limits of road vehicles in road traffic.

3. Vehicle owners, hirers or drivers have to ask for the circulation permit from the authorities before transporting unsplitable cargoes or using overload, oversize vehicles in road traffic.



### **Chapter 3.**

#### **REGULATIONS ON OVERSIZED, OVERLOADED VEHICLES AND CATERPILLARS ON ROADS**

##### **Article 9. Regulations on admissible oversized, overloaded vehicles on roads.**

1. Overloaded vehicles circulated on road (hereinafter referred to as overloaded vehicles) are road motorized vehicle with a total weight beyond the carrying capacity of bridges or axle load exceeds load capacity of road.
2. Oversized vehicles circulated on the road (hereinafter referred to as oversized vehicles) are road motorized vehicle with one of the outside demensions of both cargo loaded on vehicles (if any) exceeds the maximum size specified for the motor vehicles participating in road traffic on road.
- 3, Specialized- vehicles with total weight, axle load exceeds the limit of road, or outside dimensions exceed the maximum size specified for road motorized vehicle joining in traffic is also overloaded, oversized vehicles.
4. In addition to the above regulations, other cases will be decided by Minister of Transport.

##### **Article 10. Regulations on caterpillars on roads.**

Caterpillars must comply with compulsory conditions such as fitting heel-shoe-chain/chain – hoof, net slap, steel switch, or other measures to protect the road. Otherwise, caterpillar must be carried on the vehicle.

##### **Article 11. Circulation of oversized, overloaded vehicles and caterpillars on roads**

1. The circulation of overloaded, oversized vehicles, caterpillars on the road have to ensure the safety of traffic and road constructions.
2. Organizations, individuals who are vehicle owner, hirer or driver when using overloaded, oversized vehicles, caterpillars to circulate on the road have to comply with the following regulations:
  - a) Must have circulation permit for overloaded, oversized vehicles, caterpillars is granted by authorities defined in Article 21.
  - b) To comply with the regulations stated in the circulation permit .
3. Cargo loading vehicle exceeds payload design of manufacturer or limit of load defined by registration agency after renovation or oversized vehicles shall not be allowed to circulate on the road.

## **Chapter 4.**

### **TRANSPORTATION OF EXTRA-LONG AND EXTRA-HEAVY CARGOES ON ROADS**

#### **Article 12. Regulations on extra-long and extra-heavy cargoes**

1. Extra-long is not disassemble goods, when loaded on transport vehicles, has one of dimension outer (vehicles and goods loaded on vehicle) as following:

- a) Length is more than 20,0 meter;
- b) Width is more than 2,5 meter;
- c) Height from the highest point of the road is more than 4,2 meter for truck, stipulated on Term 3 Article 7 of this Circular.

2. Extra – heavy is not disassemble goods, weighting more than 32 ton.

#### **Article 13. Carrying vehicle for extra-long and extra-heavy cargoes**

Carrying vehicle for extra-long and extra-heavy cargo is specialzied vehicle which is designed, manufactured to carry extra-long and extra-heavy cargo, has suitable load for cargo type and shall comply with conditions specified in circulation permit .

In necessary case, carrying vehicle for extra-long and extra-heavy cargo can be renovated according to design documents which approved by authorities.

#### **Article 14. Circulation of carrying vehicle for extra-long and extra-heavy cargo**

Carrying vehicle for extra – long and extra – heavy cargo have to comply with regulations on overload, oversize vehicle and carterpillar on road in Chapter III of this Circular. Sample form circulation permit carrying vehicle for extra-long and extra-heavy cargo is attached in Appendix 2 in this Circular.

## **Chapter 5.**

### **CARGOES LOADING LIMITS OF ROAD VEHICLES FOR ROAD TRAFFIC**

#### **Article 15. Cargo loading limits of road vehicles for road traffic**

Cargo loading on road traffic vehicles should comply with the regulations on the total weight and axle load of vehicles, the cargo height, width, length allowed for vehicles in Article 16, Article 17 and Article 18 of this Circular. The cargo loading should not exceed design axle written in vehicles registration papers.

Cargo should be arranged and tied neatly on vehicles so as not to be spilled and dragged on streets which obstruct driving.

#### **Article 16. Axle load and total weight**

##### 1. Axle load:

a) Single axle: axle load  $\leq 10$  tons/axle.

b) Biaxle set (2 axles), depends on the distance (d) of the 2 axle centers:

- In case  $d < 1,0$  m, biaxle set load  $\leq 11$  tons;

- In case  $1,0 \text{ m} \leq d < 1,3$  m, biaxle set load  $\leq 16$  tons;

- In case  $d \geq 1,3$  m, biaxle set load  $\leq 18$  tons.

c) Triaxle set (3 axles), depends on the distance (d) of 2 adjacent centers:

- In case  $d \leq 1,3$  m, triaxle set load  $\leq 21$  tons;

- In case  $d > 1,3$  m, triaxle set load  $\leq 24$  tons.

##### 2. Total weight:

a) Monocoque body vehicles:

- with 2 axles, total weight  $\leq 16$  tons;

- with 3 axles, total weight  $\leq 24$  tons;

- with 4 axles, total weight  $\leq 30$  tons;

- with 5 or more than 5 axles, total weight  $\leq 34$  tons;

b) Combination of tractors with trailers or semi-trailers:

- with 3 axles, total weight  $\leq 26$  tons;

- with 4 axles, total weight  $\leq 34$  tons;

- with 5 or more than 5 axles, total weight  $\leq 40$  tons;

c) Combination of monocoque body vehicles with trailers or semi-trailers: The total weight of this combination includes the total weight of the monocoque body vehicle (corresponding to the total weight of vehicles specified in item a above) and the total axle load of trailers or semi-trailers (corresponding to the axle load regulated in part 1 above), not exceeding 45 tons.

### **Article 17. Cargoes height limits of road vehicles**

1. Vans: The allowed cargo height is the height limit within the tank according to manufacturer's design or modifying design approved by competent authority.
2. Uncover trucks: Cargo with the height exceeding the tank's height (according to manufacturer's design or modifying design approved by competent authority) should be tied and arranged carefully to ensure road traffic safety. The allowed cargo height should not exceed the following regulated height, from the highest point of roadway surface.
  - a) Vehicles with 5-ton cargo load or more (written in vehicle registration): no more than 4.2 meters of cargo.
  - b) Vehicles with 2.5-ton to 5-ton cargo load (written in vehicle registration): no more than 3.5 meters of cargo.
  - c) Vehicles with under 2.5-ton cargo load (written in vehicle registration): no more than 2.8 meters of cargo.
3. Specialized vehicles and containers: Cargo height (from the highest point of roadway surface) should comply with the following schedule:
  - a) No more than 4.35 meters, applied to the end of December 31<sup>st</sup> 2010, when passing undergrounds and bridges, the allowed speed of vehicles is only 30 km/hour or lower.
  - b) No more than 4.2 meters, applied since May 1<sup>st</sup> 2011.
4. Bulk cargo trucks, construction materials like stone, sand, gravel, coal, ores or others: Cargo height on vehicles should not exceed the height limit within the tank according to manufacturer's design or modifying design approved by competent authority.

### **Article 18. Cargoes width and length limits of road vehicles**

1. The allowed cargo width on road traffic vehicles should not exceed the width limit within the tank according to manufacturer's design or modifying design approved by competent authority.
2. The allowed cargo length on road traffic vehicles should not exceed 1,1 times than the total length of vehicles according to manufacturer's design or modifying design approved by competent authority and not be greater than 20,0 meters. When cargo length is greater than the length of vehicles' tank, the cargo should be tied carefully and signals should be used as regulations to ensure road traffic safety.
3. Passenger vehicles are not allowed to load cargo and baggages beyond the outside dimensions of vehicles.
4. Motorcycles and mopeds are not allowed to load cargo and baggages 0,30 meters beyond the width of racks according to manufacturer's design on each side; 0,50 meters beyond the back of racks. Cargo loading height from the roadway surface is 2.0 meters.
5. Non-motorized vehicles are not allowed to load cargo beyond 1/3 the body length on the front and back side; 0,4 meters on each side of wheels; 1,0 meter on the front and back side of vehicles.

## **Chapter 6.**

### **OPERATING PERMIT FOR OVERSIZED, OVERLOADED VEHICLES, CATERPILLARS AND TRANSPORTATION MEANS OF EXTRA-LONG AND EXTRA-HEAVY CARGOES ON ROADS**

#### **Article 19. General provisions on granting operating permit for oversized, overloaded vehicles, caterpillars and transportation means of extra-long and extra-heavy cargoes on roads.**

1. Only granting circulation permits to overload, oversize, chain wear vehicles and those which carry extra-long and extra-heavy cargo on specified roads and highways in special cases in which there are no choices of other more suitable methods of carrying or it is impossible to use other more suitable vehicles to carry cargo on those specified roads and highways.
2. Not granting circulation permits to oversized vehicles in case of carrying cargo that can be dismantled (taken apart) or in case of caterpillars that are not executing orders on the road.
3. Not granting circulation permits to organizations or individuals whose vehicles, transporters or clients have caused damages to roads due to using overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles on roads but have not finished their responsibility of repairing and restoring the damaged conditions of roads and highways caused by them.
4. Competent agencies for granting circulation permit have the responsibility of selecting the most suitable roads for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles; on the basis of ensuring safety for other vehicles on the roads.
5. For cases of overloaded vehicles, caterpillars and extra-heavy cargo loading vehicles beyond the load-carrying capacity of roads resulting in demand of reinforcement, those vehicles owners or their clients should be responsible for paying all the expenses of survey, reinforcing design, reinforcing implementation, accreditation costs of reinforced road (if necessary). Competent agencies just have right to grant circulation permit after completing the task of reinforcing with the report on reinforced roads quality checking result (if any) which meet the loading capacity due to the damage of overloaded vehicles, caterpillars and extra-heavy cargo loading vehicles.
6. The validity period of circulation permit.
  - a) Overloaded and oversized vehicles on roads should comply with compulsory requirements such as travelling on the regulated lane, following navigating vehicles, being escorted; or should reinforce roads or comply with other compulsory regulations of traffic safety:
    - In cases of traveling on sections or routes of roads that have just been improved or upgraded: The validity period of circulation permit is the time of each shipment or each shipment, not exceeding 60 days.
    - In cases of traveling on sections or routes of roads that have not been improved or upgraded: The validity period of circulation permit is the time of each shipment or each shipment, not exceeding 30 days.
  - b) Overloaded and oversized vehicles, extra-long and extra-heavy cargo loading vehicles on roads should comply with compulsory requirements such as being on the right lane, following navigating vehicle, being escorted; or shall reinforce roads; or should reinforce roads or comply with other compulsory regulations of traffic safety: The validity period of circulation permit is the time of each shipment or each shipment, not exceeding 30 days.
  - c) For caterpillars on roads: The validity period of circulation permit is the time of each shipment from departure place to arrival place.
  - d) The validity period of circulation permit for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles is regulated in point “a” and “b” of this

article, which should be in the range of the validity period of the certificate of technique safety checking and environmental protection for vehicles..

In the case that the validity period of the certificate of technique safety checking and environmental protection for vehicles is shorter than as regulated in point “a”, “b”, “c” of this articles, the validity period of vehicles is taken as the remaining validity period of the certificate of technique safety checking and environmental protection for vehicles.

## **Article 20. Profile, duration and sequence of granting vehicles operating permit**

1. Application documents for granting vehicle circulation permit:

a) Application for granting circulation permit for overloaded and over sized vehicles, caterpillars, extra-long and extra heavy vehicles shall be prepared as the form specified in appendix 4, appendix 5 attached with this document. Drafting drawings in which layout dimensions of vehicles are fully and accurately specified (in the case of cargo-carrying vehicle, layout dimension including length, width and height shall be counted as the vehicle is fully loaded on its trailers, semi-trailers) shall be attached in the application for granting circulation permit.

The application for granting circulation permit should be the original, clear and full version without erasing. Organizations and individuals who apply shall be vehicle owner, transporter or transport clients. Organizations and individuals should sign, write full name and seal (in the case of organization). In the case of application for granting circulation permit without seal, the proposer should come directly to do all the procedures and submit the ID card.

The application for granting circulation permit should be the original, clear and full version without erasing. Organizations and individuals who apply should be vehicle owner, transporter or transport clients. Organizations and individuals should sign, write full name and seal (in the case of organization). In the case of application for granting circulation permit without seal, the proposer should come directly to do all the procedures and submit the ID card.

b) The replica of register certificate or temporary register certificate of vehicles, tractor-trailer, trailer and semi-trailer (for newly received vehilces).

c) The copyright of vehicle features and the latest quality testing result of the certificate of technical safety testing and environmental protection for vehicles that are still validated. In the case of new vehicles, only the copyright of vehicle’s technique features is required (grantd by producer).

d) Commitment document of vehicle owners on the vehicle possession right at the time applying for granting circulation permit.

Organizations, individuals applying for granting circulation permit should submit original version or notarized copyright for comparison.

2. The period for granting circulation permit is not more than 2 days since receiving valid application.

In the case that road testing is required to determine the road capability to regulate the condition of traveling on road or reinforcing road, within 2 days since receiving all the valid documents as specified in section 1 of this article. Competent agencies for granting circulation permit should grant official document to require organizations and individuals who have

demand of putting their overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles into road to implement road testing or reinforcing.

The considering period for granting circulation permit should not be more than 2 days since receiving the report of testing result or the report of result of completing reinforcing road of eligible consultant organization ensuring safety for vehicles.

### 3. Sequence of granting circulation permit.

a, Organizations, individuals who have demand of putting overload, oversize, chain wear and overlength-overweight-cargo-carrying vehicles into road are required to do the following sequence:

- Prepare application documents for granting circulation permit as specified in the section 1 of this article.

- Submit 01 set of application documents for granting circulation permit and pay related fees as specified by the ministry of finance to competent agencies for granting vehicle travel permit.

- Make testing report or implement the task of reinforcing road (if necessary) when required by document from competent agencies for granting circulation permit. Submit 01 report of testing result or 01 report of road reinforcing result to competent agencies for granting circulation permit.

b) Competent agencies for granting circulation permit receive and check all the documents. If all valid, grant the circulation permit for organizations and individuals within period regulated in section 2 of this Article.

## **Article 21. Authority to grant vehicles operating permit**

1. General Director of road management areas grants circulation permits for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles on the road network under the nationwide management, except for vehicles specified in the section 3 of this article.

2. General Director of the Department of Transportation grants circulation permits for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles on the road network under the local management, except for vehicles specified in the section 3 of this article.

3. The Director of Directorate of Road of Vietnam grants circulation permits for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles, which should comply with compulsory requirements such as travelling on the right lane, following navigating and escorting vehicles or road reinforcing.

## **Article 22. Responsibilities of authority agencies**

1. Agencies are responsibility for granting circulation permit, ensure the right person, the solution for circulation in accordance with conditions of road, vehicle and ensure traffic safety .

2. Agencies have rights to temporarily suspend or revoke circulation permit of overloaded, oversized vehicle, caterpillars, carrying vehicle for extra-long & extra-heavy cargo violated the conditions specified in circulation permit or damaged road works that haven't completed the repairs.

### **Article 23. Test weight**

1. Equipment which is used for checking vehicle load, have to be checked, periodical inspection and granted registered certificate under legal regulations of measurement. Testing equipment must have the valid registered certificate.

2. Apply testing axle load in case there is not enough condition for testing total weighting of vehicle (Weight load testing station). In case, the vehicle has many axle-set, choose the biggest load of axle to check. The total weight of vehicle is determined by the total weight of axle.

3. Vehicle is considered exceed the maximum weight allowed to circulate on the road violated either conditions as following:

a) Total weight of vehicle exceeds the maximum weight allowed to circulation on the road specified in Term 2 Article 16 in this Circular;

b) Total weight of less than maximum weight allowed to circulate on the road, but axle load exceeds 1,1 ton the maximum axle load allowed to circulate on the road in Term 1 Article 16 in this Circulation.

## **Chapter 7.**

### **IMPLEMENTING ORGANIZATIONS**

#### **Article 24. Inspecting, testing, handling violations and compensating**

1. The provisions inspecting, testing and violations handling of this Circular shall comply with current provisions of law on inspection, inspection and handling violations.

2. In case, road works are damaged because the circulation of overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo vehicles on road does not comply with provisions of this Circular; violated organizations and individuals should be responsible for compensating as prescribed by law.

#### **Article 25. Implementing organizations**

1. Directorate for Road of Vietnam unified the management, implementation and testing of circulation permit for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles on roads; synthesized reports by competent agencies to the Ministry of Transportation before December 31<sup>st</sup> annually on granting circulation permit as prescribed in Article 21 of this Circular.

2. Responsibilities of the Department of Transport of provinces and cities under Central:



- a) Regularly inspecting and making reports on road situation within their management, and report to the Directorate for Road of Vietnam to promptly inform and direct agencies about granting circulation permit in accordance with size and load limits of road.
- b) Granting circulation permit as decentralized, and quarterly reporting the Directorate for Road of Vietnam on granting circulation permit of overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles as the form in Appendix 6a, Appendix 6b, Appendix 6c and Appendix 7 enclosed herewith in order to synthesize reports to the Ministry of Transport.

3. Circulation licensing Agencies for overloaded and oversized vehicles, caterpillars, extra-long and extra-heavy cargo loading vehicles have right to collect and use a part of fees; to grant circulation permit under provisions of the Ministry of Finance.

### **Article 26. Implementing provisions**

1. This Circular takes effect after 45 days since signing. The Decision No. 63/2007/QĐ-BGTVT on December 28<sup>th</sup>, 2007 is abrogated by the Minister of Transport "Regulations on transporting extra-long and extra-heavy cargo loading vehicles; caterpillars circulation which damage the road; overloaded and oversized vehicles on the road ", Decision 60/2007/QĐ-BGTVT on December 7<sup>th</sup> 2007 is abrogated by the Minister of Transport "Regulation on limiting line of trucks in road traffic and publicizing road loading.

2. Secretary-general of Department Office, General Inspector of Department, Directors of Department or Head of Department, General Director of Directorate for Road of Vietnam, Director of Provincial Transport Department, Head of institutions, organizations, and stakeholders take full responsibility for this Circular.

3. In the course of implementation, agencies, organizations and individuals should promptly report problems to the Ministry of Transport for consideration and settlement.

To:

- Government Offices;
- Ministries, Ministerial agencies;
- Committees of provinces and cities under central;
- Department of Document Examination (Ministry of Justice);
- Gazette, Governmental Websites;
- MOT inspectors;
- The departments under the Ministry;
- Directorate for Road of Vietnam;
- The Department of Transportation;
- Road management areas;
- Archives, DoI(10)

**Minister**

**Hồ Nghĩa Dũng**

**APPENDIX 1a**

**UPGRADED AND RENOVATED ALIGNMENTS, ROAD SECTIONS WITH SYNCHRONOUS**

No	National roads	Sections	Length (km)	Level
1	Road 1	From Hữu Nghị Quan to Pháp Vân junction	180	I, III
		From Pháp Vân junction to Cầu Giẽ (highway)	32	I
		From Cầu Giẽ (Hà Nội) to Năm Căn (Cà Mau)	2.088,7	III
2	Road 1B	From Lạng Sơn to Bắc Sơn town (Km0+000÷Km68+000)	68	IV
3	Road 1D	From Phú Tài to Phú Yên (Km0+000÷Km35+000)	35	III
4	Road 2	From Phủ Lỗ junction to Hà Giang (Km0+000÷Km313+000)	313	III
5	Road 3	From Đuông bridge junction to Bắc Kạn (Km0+000÷Km165+000)	165	III
6	Road 5	cầu Chui Junction (Gia Lâm) to Chùa Vẽ port (Km0+000÷Km106+000)	106	II
7	Road 6	From Hà Nội to Sơn La (Km9+200÷Km321+000)	311,8	III
8	Road 8	From Bãi Vọt to Cầu Treo border gate (Km0+000÷Km85+000)	85	III
9	Road 9	From Cửa Việt port to Lao Bảo border gate (Km0+000÷Km99+000)	99	III
10	Road 10	Bí Chợ Junction to Ninh Bình city (Km0+000÷Km141+760)	141,76	III
11	Road 14	From Ngọc Hồi (Buôn Ma Thuột) to Chơn Thành (Km718+000÷Km988+000)	270	IV
12	Road 14D	From Giành bridge to Nam Giang border gate (Km0+000÷Km74+307)	74,307	III
13	Road 18	From Bắc Ninh city to Móng Cái border gate (Km0+000÷Km365+000)	365	III
	Nội Bài - Bắc Ninh	Crossing section between Road 2 and Bắc Ninh city	41,5	II
14	Road 19	From Giành bridge junction to Phù Đổng junction (Km15+000÷Km152+000)	137	III

15	Road 20	From Dầu Dây (Đồng Nai) to Đà Lạt city (Km0+000÷Km268+000)	268	IV
16	Road 21	From Sơn Tây commune (Hà Nội) to Km17+300 (cross Láng – Hòa Lạc highway)	17,3	III
		From Bông Bông slope (Hà Nam) to Nam Trục (Nam Định) (Km98+000÷Km155+600)	57,6	III, IV
17	Road 22	From An Suông intersection to Mộc Bài bordergate (Km0+000÷Km58+600)	58,6	III
18	Road 25	From Chi Ngọc commune to Chư Sê town (Km69+000÷Km180+810)	111,81	III
19	Road 27	From Krông Nô bridge to Liên Khương junction (Lâm Đồng) (Km83+000÷Km174+000)	91	III, IV
20	Road 32	From Sơn Tây commune to Khế pass (Km41+000÷Km146+000)	105	III
21	Road 37	From Lũng Lô pass to Cò Nồi junction (Km365+000÷Km464+000)	99	IV
		From Tiên Trung junction to Sao Đỏ junction (Km0÷Km22+300) (QL183 cũ)	22,3	III
22	Road 38	From Bắc Ninh city to Đồng Văn junction crossing Road 1 (Km0+000÷Km84+500)	84,5	III
23	Road 39	From Provincial Road Km8+350 196 to Triều Dương (Km0+000÷Km44+000)	44	III
24	Road 43	From Gia Phù Junction to Lóng Sập border gate (Sơn La) (Km0+000÷Km105+000)	105	IV
25	Road 46	From Cửa Lò to Đô Lương (Km0+000÷Km73+000)	73	III
26	Road 51	From Vũng Tàu junction to Km73+600 (Km0+000÷Km73+600)	73,6	III
27	Road 279	From Bảo Yên district to Lai Châu (Km36+000÷Km201+000)	165	IV
28	Láng - Hòa Lạc Highway	From Láng interjunction to Hòa Lạc junction (Km0+000÷Km30+160)	30,16	III
29	Dịch Vọng – Nội Bài	From Dịch Vọng junction to Nội Bài airport	23	I

30	Road to the Dung Quất port	From Km1028/Road 1 to Dung Quất port (Km0+000÷Km8+800)	8,8	III
31	Hồ Chí Minh Road	Eastern: from Hòa Lạc junction to Cam Lộ Quảng Trị (Km409 ÷ Km1068)	673	IV
		Western: from Khe Gát (Quảng Bình) to Thạch Mỹ (Km0+000 ÷ Km495+000)	495	IV
		From Thạch Mỹ to Cảnh Tân (Km495+000 Western/Km1271+000 Eastern ÷ KM1512+000)	241	IV

### APPENDIX 1b

#### LIMIT OF ROAD

No	Road levels		Highway	I	II	III	IV	V	VI
1	Lane width (m)	Mountainous areas	-	-	-	3,0	2,75	3,5	3,5
2		Delta	3,75	3,75	3,75	3,5	3,5	2,75	3,5
3	Height (m)		4,75				4,5		

**APPENDIX 2**

**Circulation permit granting  
Agency**  
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**SOCIALIST REPUBLIC OF VIETNAM  
Independence - Freedom - Happiness**  
-----

No: .../CĐBVN (SGTVT hoặc  
KQLĐB ...)-GLHX

Date .....

**CIRCULATION PERMIT FOR OVERLOADED AND OVERSIZED VEHICLES,  
EXTRA-LONG AND EXTRA-HEAVY CARGO LOADING VEHICLES ON ROAD**

*Valid till the end of date.....*

- Pursuant to paragraph 2 of Article 28 of the Law on Road Traffic dated 13/11/2008.
- Pursuant to Circular No.... /2010/TT-BGTVT dated ....., regulated on load and size limits of roads; circulation of overloaded and oversized vehicles, caterpillars; extra-long and extra-heavy cargo loading and cargo loading limits on vehicles for road traffic.
- Considering application dossier of granting circulation permit for overloaded and oversized vehicles of ..... (name of organization or individual), date.....

**The circulation for overloaded and oversized vehicles on road is regulated specifically as:**

Type (code): ..... Registered number plate: .

With semi-trailers/trailer: ..... Registered number plate: .....

Owned by ..... (name of organization or individual) .....

With the following parameters:

+ Type of cargo: ..... After removing accessories (if any): .....

+ The dimension of the whole vehicle with cargo:

- Length: ..... m; Cargo beyond the back of vehicle: ... m; Cargo beyond the front of vehicle: ...m;

- Width: .....m; Cargo beyond on both 2 sides of vehicle: ..... m;

- Height (From the road surface): .....m.

+ The total weight of vehicle with cargo: ... tấn (..... tons of vehicle with tractor; ..... tons of trailer and semi-trailers; .....tons of cargo).

+ Departure ..... (write in details Km ...../Road (section) .....,place) .....

+ Destination ..... (write in details Km .... /Road (section)....., place) .....

+ Allowed sections: ..... (write in details and full name of road sections which are allowed to pass, reversing positions and the control points from departure to destination)

**The regulated conditions for vehicles on the road**

- The drivers and owners of vehicles should comply with the provisions of the Road Traffic Law.
- Vehicle brake systems should have sufficient force (including semi-trailers or trailers). Interconnected system between tractors and trailers or semi-trailers should be ensured, safety and comply with regulations of the manufacturer.
- When crossing bridges, vehicles should follow right lanes ... ..with speed at... .. to avoid shaking and causing the eccentricity which results in increasing the influence of load on deck girder system. Stopping, parking or braking on the bridge is strictly forbidden.
- Vehicles must observe the inspection and control of the controlling traffic forces on the road.
- Only returning this paper once vehicle owners want to change circulation permit.

**Leaders of Circulation permit granting Agency  
(Signature, name and seal)**

### APPENDIX 3

**Circulation permit granting  
Agency**  
-----

**SOCIALIST REPUBLIC OF VIETNAM  
Independence - Freedom - Happiness**  
-----

No: .../CĐBVN (SGTVT hoặc  
KQLĐB ...)-GLHX

Date .....

#### **CIRCULATION PERMIT FOR SELF-PROPELLED CATERPILLARS ON ROAD**

*Valid till the end of date.....*

- Pursuant to paragraph 2 of Article 28 of the Law on Road Traffic dated 13/11/2008.
- Pursuant to Circular No.... /2010/TT-BGTVT dated ....., regulated on load and size limits of roads; circulation of overloaded and oversized vehicles, caterpillars; extra-long and extra-heavy cargo loading and cargo loading limits on vehicles for road traffic.
- Considering application dossier of granting circulation permit for overloaded and oversized vehicles of ..... (name of organization or individual), date.....

#### **The circulation for self-propelled caterpillars on road is regulated specifically as:**

Type (code): ..... Registered number plate: .....

Owned by ..... (Name of organization or individual) .....

With the following parameters:

- Length: ..... m;
- Width: .....m;
- Height (From the road surface): ..... m;
- The total weight of vehicle with cargo: ..... tons;
- Type of caterpillars (flat chain or sharp chain): .....
- + Departure ..... (write in details Km ...../Road (section) .....,place) .....
- + Destination ..... (write in details Km .../Road (section)....., place) .....
- + Allowed sections: ..... (write in details and full of road sections which are allowed to reversing positions and the control points from departure to destination).....

#### **The regulated conditions for vehicles on the road**

- The drivers and owners of vehicles should comply with the provisions of the Road Traffic Law.
- Vehicle brake systems should have sufficient force (including semi-trailers or trailers). Interconnected system between tractors and trailers or semi-trailers should be ensured, safety and comply with regulations of the manufacturer.

- When crossing bridges, vehicles should follow right lanes ... ..with speed at... .. to avoid shaking and causing the eccentricity which results in increasing the influence of load on deck girder system. Stopping, parking or braking on the bridge is strictly forbidden.
- Vehicles must observe the inspection and control of the controlling traffic forces on the road.
- Only returning this paper once vehicle owners want to change circulation permit.

**Leaders of Circulation permit granting Agency  
(Signature, name and seal)**



**APPENDIX 4**

**SOCIALIST REPUBLIC OF VIETNAM  
Independence - Freedom - Happiness**

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**APPLICATION FOR VEHICLES CIRCULATION PERMIT ON ROAD**

Respectfully to: ..... (Name of Circulation permit granting Agency) .....

- Requesting individuals and organizations: .....

- Address: ..... Telephone number: .....

Requesting circulation permit for overloaded and oversized vehicles with the following parameters:

**VEHICLES**

- Type: .....

- Branch: ..... Registered number plate: .....

- Branch of semi-trailers or (trailers): .....

- Registered number plate: .....

- Dimensions of vehicle including semi-trailers: Length x Width x Height: ..... (m)

- Dimensions of trailers: Length x Width x Height: ..... (m)

- Design load of vehicle (or semi-trailers vehicle): ..... (tons)

- Design load of trailer: ..... (tons)

- The body weight: ..... (tons) The semi-trailers weight (trailers weight): ..... (tons)

- The number of axles: ..... The number of back axles: ..... The number of semi-trailers: .....

- The number of trailers: ..... The number of back trailers: .....

**CARGO**

- Type: .....

- The cargo weight: .....

- The width of vehicle with cargo: ..... (m) Cargo beyond on 2 sides of vehicle: (m)

- The length of vehicle with cargo: ..... (m) The height of vehicle with cargo: .. (m)

- Cargo beyond the front of vehicle: .....(m) Cargo beyond the back of vehicle: (m)

**ROUTE AND TIME TRAVEL**

- Transport routes (write in details and full of road sections which are allowed to pass, reversing positions): .....

- Proposed circulation time: From ..... to .....

(Application for circulation permit should be attached to the vehicle diagram, clearly showing the dimensions: length, width, height of vehicle with cargo, distance between the axles and vehicle tail)

*Date* .....  
Representatives of individuals and  
organizations  
signature, seal

**APPENDIX 5**

**THE SOCIALIST REPUBLIC OF VIETNAM  
Independent – Freedom – Happiness**

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**APPLICATION FOR CATERPILLAR'S CIRCULATION PERMIT**

To:.....(name of authorities).....

- Individuals, organizations

request:.....

- Address: .....Telephone:

- Request for issuing caterpillar's circulation permit:

- Plate number (if any)

- Weighing of vehicle:.....(ton)

- Dimension of vehicle:

+ Length:.....(m)

+ Width:.....(m)

+ Height:.....(m)

- Chain type ( sharp chain or flat chain).....

- Width of chain-wheel each side: .....(m)

- Distance between outers of wheel: .....(m)

- Transportation route (write in details and full name of road sections and reversing positions)

- Request time for circulation: from  
.....to.....

(Application for circulation permit should be attached to the vehicle diagram, clearly showing the dimensions: length, width, height of vehicle with cargo, distance between the axles and vehicle tail)

*Date* .....  
Representatives of individuals and  
organizations  
signature, seal

**APPENDIX 6a**

Circulation permit granting agency  
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**THE SOCIALIST REPUBLIC OF VIETNAM**  
**Independent – Freedom – Happiness**  
-----

Số: .../SGTVT (KQLDB ...)-GLHX

....., ngày ... tháng ... năm ...

**Report on granting circulation permit for overloaded vehicle (including caterpillar)**

(month.....year.....)

To:.....

Vehicle type Route	2 single-axle vehicle	Triaxle vehicle	Four - axle vehicle	Caterpillar	Combination vehicles - semi-trailer (triaxle)	Combination vehicles - semi-trailer (four - axle)	Combination vehicles - semi-trailer (five - axle)	Combination vehicles - semi-trailer (six-axle)	Total	Overload cargo transportation	Note
National highway											
Provincial road											
...											
<b>Total</b>											

Note: - note column specified vehicle name with total weight of vehicle and largest cargo

Leader of circulation permit granting agency  
(signature, name and seal)

- Number of circulation permit granted for vehicles with large total weight

**APPENDIX 6b**

**Circulation permit granting agency**  
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**THE SOCIALIST REPUBLIC OF VIETNAM**  
**Independent – Freedom – Happiness**  
-----

Số: .../SGTVT (KQLDB ...)-GLHX

....., ngày ... tháng ... năm ...

*Date*

**Report on granting circulation permit for oversized vehicle (including caterpillar)**

(month.....year.....)

To:.....

Vehicle type route	2 single- axle vehicle	Triaxle vehicle	Four - axle vehicle	Caterpillar	Combination vehicles - semi-trailer (triaxle)	Combination vehicles - semi-trailer (four - axle)	Combination vehicles - semi-trailer (five - axle)	Combination vehicles - semi-trailer (six-axle)	Total	Overload cargo transportation	Note
National highway											
Provincial road											
...											
<b>Total</b>											

Note: note column specified vehicle name with total dimension  
(length,width,height);

– Number of circulation permit granted for vehicles with large  
dimensions.

Leader of circulation permit granting agency  
( signature, name and seal)

**APPENDIX 6c**

**Circulation permit granting agency**  
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**THE SOCIALIST REPUBLIC OF VIETNAM**  
**Independent – Freedom – Happiness**  
-----

Số: .../SGTVT (KQLDB ...)-GLHX

....., ngày ... tháng ... năm ...

*Date*

**Report on granting circulation permit for oversized, overloaded vehicle (including caterpillar)**

(month.....year.....)

To:.....

Vehicle type route	2 single- axle vehicle	Triaxle vehicle	Four - axle vehicle	Caterpillar	Combination vehicles - semi-trailer (triaxle)	Combination vehicles - semi-trailer (four - axle)	Combination vehicles - semi-trailer (five - axle)	Combination vehicles - semi-trailer (six-axle)	Total	Overload cargo transportation	Note
National highway											
Provincial road											
...											
<b>Total</b>											

Note: - note column specified vehicle has circulation permit:

+ dimension + length,width,height;

+ total weight of vehicle and vehicle with large total weight;

- Number of circulation permit for vehicle with large dimension and total weight.

Leader of circulation permit granting agency  
( signature, name and seal)

**PHỤ LỤC 7**  
**APPENDIX 7**

**Circulation permit granting agency**  
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**THE SOCIALIST REPUBLIC OF VIETNAM**  
**Independent – Freedom – Happiness**

Số: .../SGTVT (KQLĐB ...)-GLHX

....., ngày ... tháng ... năm ...

*DATE*

**REPORT ON TOTAL NUMBER OF CIRCULATION PERMIT FOR OVERLOADED,  
OVERSIZED VEHICLES, CATERPILLAR**

(Month.....year.....)

To :.....

No	Vehicle type	Oversized	Overloaded	Overloaded and oversized	Total	Transportation of overloaded,oversized cargo		Note
						Authorized regularly	authorized each trip	
1	2 single-axle vehicle							
...	Vehicle ...axle							
...	Caterpillar							
...	Combination of triaxle vehicle							
...	Combination of vehicle... axle							
	<b>Total</b>							

Note: - note column specified vehicle has circulation permit:  
+ dimension + length,width,height;  
+ total weight of vehicle and vehicle with large total weight;  
- Number of circulation permit for vehicle with large dimension and total weight.

Leader of circulation permit granting agency  
( signature, name and seal)

**3.8 No. 90/2004/TT-BTC (CIRCULAR): GUIDANCE COLLECTION, REMITTANCE, MANAGEMENT AND ROAD USAGE FEE**



## **CIRCULAR**

### **OF MINISTRY OF FINANCE No. 90/2004/TT-BTC DATED SEPTEMBER 7th, 2004 ON GUIDANCE COLLECTION, REMITTANCE, MANAGEMENT AND ROAD USAGE FEE**

*Pursuant to the Ordinance on charge and fee No 38/2001/PL-UBTVQH10 dated August 28th, 2001 and Decree No 57/2002/NĐ-CP dated June 3rd, 2002 by Government in detailing the implementation of the Ordinance on charge and fee;*

*Pursuant to Decree No. 77/2003/NĐ-CP dated July 1 st,2003 by Government on functions, tasks, authorities and organizational structure of Ministry of Finance;*

*Ministry of Finance guiding collection, remittance, management and road usage fee, as follows:*

#### **PART I GENERAL PROVISION**

##### **I. INTERPRETATION OF TERMS**

In this Circular the following terms are construed as follows:

1. Roads, including: roads, bridges, tunnels.
2. Collected fee road is roads have to be charged and enforced by state agency authorized.
3. Road toll stations, including road operators, ticket sellers, gate tickets, toll control device, lighting systems and other ancillary works for collection fees.
4. Vehicle, including: automobiles (including: 3 wheel vehicle, tuk tuk, farm vehicle), tractor, 2 wheel motorcycle, 3 wheel motorcycle, motorized vehicle, and similar vehicles, including vehicle used for disabled people.
5. Specilized motorcycle, including: construction machines, agricultural – forestal vehicle are on road.

##### **II. CONDITIONS OF APPLICATION TO ROAD CHARGE**

Specified type of road toll charges and organizations must have enough conditions as follows:

1. Completion the construction, maintenance and upgrade project was approved by the authorities to ensure quality of traffic service well before charging.

2. Belonging to road toll network planning under the road toll by the authorities after consulting the Minister of Finance, as follows:

- For national highway, must be under highway network planning and decision of establishment toll station by Minister of Transport;

- For local roads, must be under local roads network planning and decision of establishment by provincial People's Councils. Publication network planning local toll and decision of establishment toll station by provincial People's committees shall be sent to the Ministry of Finance and Ministry of Transport within 15 days since issued.

In case the toll station settle in road which is not under local roads network planning by authorities as the provisions above, before the construction of toll stations, company or investor must submit documents to the Ministry of Finance, highlight: length routes, location and number of toll stations (estimated and current toll stations); length of routes and reasons for placing the toll station. MOF studies and give opinion on paper within 30days since receiving documents.

3. Completion the construction of ancillary works for collection fees, such as: building toll stations (ticket selling place, ticket place...) lighting systems, many type of tickets, control of collecting and ticketing organization...

4. MOF issued regulations on toll level for national highway or provincial People's Council issued a resolution or decision toll fee on local road in accordance with planned typed of road.

### **III. SUBJECTS OF APPLICATION**

1. Subject be charged on using road are mean of transport, specialized motorcycle, (hereinafter referred to as a vehicle).

2. Organizations, individuals (Vietnamese and foreigner) has vehicle which in listed charging table, shall pay fee using road (hereinafter referred to as toll) specified in this Circular.

3. Organizations, individuals (Vietnamese and foreigner) drive vehicle have to pay toll by ticket (the ticket specified by MOF) for each time travel through toll station as specified (unless case in point 4 of this term)

4. Free toll fee for these cases, as follows:

a) Ambulances, including other vehicles carrying accident victims to first-aid station.

b) Fire-truck

c) Agricultural – forestal vehicle, including: plows, harrows, planting machines, weeding machines, rice threshing machines.

d) Dike maintenance vehicle, flood prevention vehicle.

e) Vehicles used exclusively for defense and security, including tanks, armored vehicle, pulling artillery vehicle, military truck.

In addition, for specialized vehicle for defense, including vehicle with license plate: red background, submerged stamped white letters and number (hereinafter referred to as red

license plate) is attached specialized equipment for defense (not the empty bucket truck) such as: cranes, tanks, generating... moreover, national defense's vehicle or more than 12 seat car, van has seats in tank, with red license plate (no matter that carrying soldier or not).

Vehicle used exclusively for security (hereinafter referred to as motorcycle, automobile) of police (Ministry of Public Security, provincial police, city police ...) includes:

- Motorcycles, patrol car of Traffic police has characteristics: light on rooftop and both sides of the car, "Traffic police" words on the car.
- 113 police motorcycle, car has "police 113" words on both sides.
- Urgent police motorcycle, car has "urgent police" words on both sides.
- Motorcycle, car of police are on duty, using one of priority signal in accordance with law in emergency case.
- Van has seats in tank carrying soldiers on duty.
- Special vehicles carrying prisoners, rescue vehicles, and salvage.

Other vehicles (excluding specialized national defense's vehicle above) have to pay toll and fee using road in point 4 Section I and II of this Circular.

g) Funeral convoy.

h) Vehicle lines have escort motorcycles.

5. For toll section which unresolved traffic congestion, shall be temporarily non- collection fee with 2 wheel vehicles, 3 wheel vehicles, 2 wheel motorized vehicles, 3 wheel motorized vehicles (hereinafter referred to as motorcycle).

Based on the traffic situation at each toll station, the organizations are in charge collecting fee should report the MOT and MOF (for national highways) or provincial People's council (for local roads) on traffic jam, specific recommendations on temporary non-collection fee with motorcycle defined in this point.

Based on recommendations of these organizations, MOT's opinion and investigation, survey existing situation, MOF's consideration, decision of provincial People's Council decided temporarily not to collect fee with motorcycle at each toll station. Pending time of decision of authorities, toll station still has to charge for motorcycle as regulation.

## **PART II**

### **COLLECTION RATE AND MANAGEMENT, USING COLLECTED FEE WITH EACH ROAD**

#### **I. ROAD INVESTED BY CAPITAL OF STATE BUDGET**

1. Road invested by state budget capital specified in this Circular, including:

- a) Road invested by state budget (center budget or local budget)
- b) Road with capital investment comes from state budget, such as: money from collection fee, non-refundable aid, cash assistant contributed by organization, individuals ...
- c) Road investment in loans and repay state budget, regardless state budget to pay the debt completely (including principal and interest) or state budget just to pay the principal, loan interest paid in fee (including state budget capital by borrowing or loan by the investor).
- d) the other road managed by State, such as: road invested for business, after business period transferred to state management; investment in BT form ( State pay for organizations & individuals who invest, then transfer to State to manage); road constructed in the form of exchanging land for construction (and the State give land, organization & individual in charge of construction) etc ...

2. Collected fee rates which invested by state budget capital, is applied to all toll stations according to Fee Table attached to this Circular.

3. In implementation period, MOT and People's committees of provinces and cities under central need to research, organize, and reduce inappropriate toll station, to ensure that minimum distance between 2 toll stations in all road section is 70 km or more.

For the road sections start collect fee (from the date this Circular takes effect) have to ensure not only the conditions specified in section II part III of this Circular but also the minimum distance between 2 toll stations is 70 km.

In special cases, the distance between 2 toll stations less than 70 km, the MOT or principal People's Council prepare document send to MOF, stating the reason for collecting fee, fee proposal (including: investment method, construction period, estimate time for using works, length and quality of road, construction of toll station, conditions to ensure toll operation, estimate time to start collecting fee, capacity of vehicle circulation, planning for charging rate, efficiently) to MOF for consideration and decision.

4. Toll collection operator which invested by capital of state budget, has to open an account at State Treasury for transaction.

Collected fee must be transferred to the account daily and be managed, used as follows:

4.1 Toll collection operator retains a portion of collected fee before transferring to State Budget in percentage (%), specifically:

- a) Local toll collection operator retains a portion of collected fee in percentage according to decision of President of provincial People's Committee.
- b) National highway toll collection operator retains 20% of the total amount of collected fee.

Toll collection operator has to send to Directorate for roads of Vietnam to focus on investment and approved project, specified: in the 20% rate is deducted 5 % (equal to 25% of the total amount) to create investment capital to modernize the toll technology, 15% (equal to 75% of the total amount) to pay expense of toll service according to the estimates approved by authorities in b.1, b.2, b.3 as follows:

b.1 Payment for regularly activities of toll organization:

- Salaries, allowances (social insurance, health insurance, trade-union fee)

- Management fee: business fee, conference, communications, public service (electricity fee, water fee), offices suppliers, meeting fee...
- Food expenses for workers, the maximum not exceeding the minimum salary specified by State.
- Payment for labor protection or uniform according to regulations (if any);
- Payment for regular repair of office, equipment, toll station.
- Payment for security (if any)
- Payment for ticket, stamp (if any)
- Payment for purchasing of spare equipment and working tools for toll service;
- Indirect payment for toll collection operator (for State enterprises are appointed to collect fee)
- Other expenses (if any)

b.2. Deduction for reward and welfare fund for officials, staffs who work directly at toll station. The level of both reward and welfare funds is on average yearly. A person is rewarded maximum of three - month salary if revenue is higher than the year before or two -month salary if revenue less/equal to year before.

b.3 Payment for investment expenditure technological modernization toll: procurement, installation equipment toll (Automata, semi-automatic); purchase of equipment to count vehicle according to the estimates approved by authorities. The investment in the modernization procurement technology fee for bidding under the current regulation of the State.

For irregular expenses and special expenses under regulation of designer, such as: expense for broadening operator, toll station, maintenance of bridges, lighting of bridges (for road section with bridge), security, buying cash car – cash car will be repaired by state budget annually (central budget for highways, local budget for local roads)

4.2 For road invested by loaning, state budget pays principal. Toll operator retains the percentage mentioned in 4.1 to pay for interest.

All the expenses specified in 4.1 and 4.2 are not accounting to reflect in the state budget, but must be balanced the financial estimates of the toll collection operator annually by authorities' decision. The use must have legal documents and annual implementation of this settlement expenses.

The toll organizations, based on the amount deducted to pay for the service charge of toll collection operator (15%) and the expenditures as approved.

Toll organizations, based on amount deducted to cover expenses for operating toll service (15%) and the estimate expenditures as approved (estimate yearly divided into monthly, quarterly), if the deduced amount much more than the expenses, the different amount must be transfer to account of Directorate for roads of Vietnam. Directorate for roads of Vietnam will divide to other organizations which doesn't have enough revenue to ensure minimum salary for staff according to regulation.

Directorate for roads of Vietnam open account at State Treasury for transaction to keep track the revenue – expenditure of investment fund to modernize the toll technology. 5% comes

from collected fee and the different amount of toll organization. At the same time, open separate accounting record book of each fund, if unused in one year, the rest can be used in the following year and settlement annually with MOF. If funds can't be spent all for toll service in three consecutive years, the remaining must be transferred to fund for modernizing toll technology.

4.3 The total amount of revenues, after subtracting the amounts specified in 4.1 and 4.2, toll collection operator shall have to transfer the remaining to the State budget as regulation following:

a) Toll collection operator declare the collected fees monthly and submit directly the declaration to Tax agency within first 5 days of following month. The declaration must be filled with ticket number, ticket type, amount of collected fee, amount of retained money, amount of money sent to State budget previous month as No.2 form attached to Circular No. 63/2002/TT-BTC dated July 24<sup>th</sup> 2002 of MOF guiding legal fee and charge.

Pursuant to the declaration, toll organizations prepare procedure to send to State Budget. The deadline for submission the collected fee is 15<sup>th</sup> of following month (with chapter, type, term, section 036, subsection 01 Index regulated by State (collected fee managed by central, will be submit to central budget. Collected fee managed by local, will be submitted to local budget)

b) Tax agency have to check declaration, compare each issued & used ticket to verify collected fee, the amount sent to state budget and notify to toll collection operator the amount of money they have to send to State budget monthly.

c) Finance agency send total amount of money which toll collection operator submitted to State budget to allocate capital for management, maintenance road systems under current regulations on State budget and financial management, road maintenance.

5. Set up estimate on collection – expenditure:

Annually, toll collection bases on subjects of application, toll rate on each type of vehicle, number of vehicle, levels of financial expenditure to set up estimation on collection – expenditure under the guidance of MOF on the assignment, execution and settlement of State budget as follows:

a) For organization has toll station on national highways:

- Management and Maintenance Company which is under Regional road management unit set up estimation on collection – expenditure planning yearly and send to Regional road management unit review before sending to Directorate for roads of Vietnam.

- Units (public enterprise and enterprise unit ) which is under Department of transport, is appointed to manage toll stations on national highway by MOT and set up estimation on collection – expenditure sent to MOT review before sending to Directorate for roads of Vietnam.

- Directorate for roads of Vietnam considers and reviews the estimation document before sending to MOT. MOT sum up with annual budget estimation and send to MOF.

b) For organization has toll station on national highways:

- Units (public enterprise) which have toll station, set up estimation on collection – expenditure and send to Department of transport. Department of Transport synthesize with annual budget estimation and send to local MOF.

c) Estimation on collection – expenditure, including:

- Estimation on collection, including revenue submitted to State budget and retained revenue under regulations.
- Estimation on expenditure in portion to the contract, ensuring compliance with the contents specified in Point 4.1, Part I, this Section.

Estimation of road collection – expenditure has to be set up for each toll station, with notes in detail by toll organization.

6. Assignment of toll revenue-expenditure estimates:

a) For national highway toll- collecting operator:

- For units under regional road management unit: Based on the road toll revenue-expenditure estimates assigned by competent authorities, the regional road management unit's toll revenue- expenditure estimates detailed to every toll station, the standard norms and the current financial expenditure regimes, Directorate for roads of Vietnam assigns the revenue estimates and expenditure percentages on the total collected amounts to regional road management unit, detailed to each toll station; the regional road management unit shall assign revenue estimates and regular expenditure percentages on the total collected amount to road managing and repairing companies, detailed to each toll station.

- For units under the department of transportation entrusted by the ministry of transport to manage national highways with toll stations: Directorate for roads of Vietnam assigns road and bridge toll revenue estimates and regular expenditure percentages on the total collected amounts to the transport services, detailed to each toll station. The transport service assigns estimates to units, detailed to each toll station.

b) For local road toll collection operator:

Based on road toll revenue-expenditure estimates assigned by competent authorities, the toll revenue-expenditure estimates made by units with toll station, the standard norms and current financial expenditure regimes, the transport service assigns road toll revenue estimates and regular expenditure percentages on the total collected amounts to units, detailed to each toll station.

The assignment of road toll revenue estimates and percentages left for regular expenditures on the total collected amounts by the ministry of transport, Directorate for road of Vietnam and the transport service to their respective attached units with toll stations must ensure the principles: The revenue must not be lower and the regular expenditure percentage must not be higher than the level assigned by competent authorities, detailed according to revenue-expenditure contents in Item b.1. Item b.2, Point 4.1, Section I of this Part.

The road toll revenue estimates, the regular expenditure percentage on the total collected amounts, which are assigned to units (detailed to each toll station) of Directorate for road of Vietnam and the transport service must be sent to finance bodies of the same level and tax agencies, the State Treasuries where units having toll stations register their transactions.

Based on the revenue estimates, regular expenditure percentage on the total collected amounts, units make quarterly revenue-expenditure estimates (divided to each month) and send them to

the tax agencies, the State Treasuries where the units register their transactions, and concurrently to the senior managing agencies.

7. Observance of road toll revenue-expenditure estimates:

a) Based on expenditure estimates notified by competent authorities, the collected amounts actually remitted into the State Treasuries, the expenditure-approving orders of the unit heads and lawful vouchers, the State Treasuries shall control expenditures, allocate advances or make payments to units under the provisions of the Finance Ministry's Circular No. 79/2003/TT-BTC of August 13, 2003 guiding the regime of management, allocation and payment of state budget expenditures through the State Treasuries.

b) Annually and quarterly, based on the toll amounts actually remitted into the state budget, Directorate for roads of Vietnam sums up the national highway toll amounts and the transport service sums up local road toll amounts, certified by the State Treasuries. Based on the toll amounts actually remitted into the state budget, finance bodies transfer the sources to the State Treasuries for allocation and payment. Based on the toll sources reallocated by finance bodies, Directorate for roads of Vietnam and the department of transportation assigns estimates to their respective units after reaching agreement with finance bodies and send them to the State Treasuries for control and payment in form of estimated expenditures from the State Treasuries.

8. Accounting and settlement of road toll revenues and expenditures:

a) Toll-collecting units must account and settle toll revenues and expenditures strictly according to current accounting and statistical regimes. At quarter-end and year-end, the toll collection operators must make reports on settlement of toll revenues and expenditures after completing the settlement with tax agencies of the collected toll amounts, the payable amounts and the amounts already remitted into the budget, the amounts retained and the amounts actually spent according to the provisions of this Circular.

b) The superior managing agencies of toll collection operators have to examine and notify the consideration and approval of toll revenue-expenditure settlements of their attached units and send sum-up settlement reports to finance bodies of the same level for appraisal and notify the approval of settlements together with annual settlements of the managing agencies.

## **II. ROAD INVESTED BY THE STATE WITH LOAN CAPITAL AND TOLL COLLECTION FOR CAPITAL RECOVERY**

1. Roads invested by the State with loan capital and toll collection as mentioned in this section are roads whose investors (State management agencies in charge of land roads) are permitted by the State to borrow capital for investment, then to collect tolls for repayment of loan capital under investment projects approved by competent state bodies (excluding roads invested with loan capital for business purpose).

2. The toll rates applicable to roads invested by the State with loan capital and toll collection for capital recovery shall comply with the toll rates applicable to roads invested with state budget capital specified at Point 2, Section I of this Part. In cases where the application of toll rates for roads invested with state budget capital fails to ensure the capital recovery under the



approved investment projects, the investors must request in writing the competent agencies (the Ministry of finance for national highways; provincial-level People's Councils for local roads) to decide on appropriate toll rates, which, however, shall not exceed twice the toll rates applicable to roads invested with state budget capital. The procedures and order for issuing decisions providing for the toll rates mentioned in this section shall be as follows:

a) Within 60 days before the date of starting the toll collection, investors must send to the Ministry of finance (for national highways) or the provincial-level People's Councils (for local roads) the official letters requesting the latter to specify the toll rates, enclosed with the following dossiers:

- Road investment projects approved by competent authorities (clearly stating the road grade and the length of the toll sections, the toll rates approved under projects), the time limit for completion of construction and putting of the works to use.

- The toll collection scheme, covering: toll stations (automatic, semi-automatic, manual, conditions on lighting electricity...), the estimated collection amounts (if different from the collection amounts inscribed in the projects approved by competent agencies, the reasons must be stated clearly), the projected revenue sources, toll collection efficiency and the time for capital recovery.

b) Within 30 days before starting the toll collection, the Ministry of finance or the provincial-level People's Councils must consider and decide on the toll rates and notify them in time to investors for deployment of toll collection. Where the provincial-level People's Councils issue decisions on toll rates for locally-managed roads, such decisions must also be sent to the Ministry of finance and the Ministry of transport for monitoring the implementation.

3. Toll collection operators must open toll collection accounts at the State Treasuries of their respective transactions. The toll amounts collected daily must be deposited into the accounts opened at the State Treasuries and shall be used as follows:

a) Making deductions in percentage for toll collection operators to cover expenses for toll collection and expenditures specified at Point 4.1, Section I of this Part (roads invested with state budget capital).

b) The remainder (the total collected toll amount minus the amount retained in percentage as provided for in Item a of this Point) shall be transferred into the accounts opened by investors or units entrusted to accept and repay debts on behalf of investors at the State Treasuries at the end of a month. When debts turn due, these units shall carry out procedures for payment to the lending units strictly according to the provisions of Joint Circular No. 90/2001/TTLT-BTC-BGTVT of November 9, 2001 of the Ministry of finance and the Ministry of transport guiding the management and settlement of state budget capital and road tolls for repayment of development investment credit loan capital of the State for traffic projects.

4. The entire toll amounts used for debt repayments stated at Item b, Point 3 of this Section must be recorded for mutual ceasing via the state budget according to the following procedures and order:

- Annually, once every six months (the first half and the second half of the year), the toll collection operators must sum up toll revenue-expenditure settlements in the period, clearly stating the toll amounts collected, the toll amount used for each spending item with detail on the spending item of deductions payable to the investing agencies and send such settlement summary to the directly managing tax agencies.

- The tax agencies shall examine the toll revenue expenditure settlement of each unit, determining the amount actually collected, the amount actually spent, including amounts deducted for creation of sources for repayment of loan capital, send documents together with revenue-expenditure settlements to the Ministry of finance (General Department of Taxation, for national highways) or the Finance Service (for local roads). The General Department of Taxation shall examine, sum up and transfer them to the Administrative and Non-Business Department for submission to the Ministry of finance for consideration and decision on mutual ceasing for national highways; the Finance Services shall decide on mutual ceasing for each locality (the mutual ceasing of the state budget must not be later than the time for adjustment of the preceding year's settlement).

- Based on toll collection vouchers made in form of mutual ceasing, the General Department of Taxation shall announce the budget revenue amount at each national highway toll station and the Finance Services shall announce the budget revenue amount at each local toll station to Tax Departments for sum up of the state budget revenue amounts in the localities.

- Investors or units entrusted to accept and repay debts on behalf of investors shall have to strictly monitor the repayment of debts and capital amounts borrowed by the State for investment in upgrading roads with toll collection for capital recovery. For roads with loan capital fully recovery under the approved projects, there must be reports to the Ministry of finance, the Ministry of transport (for national highways) or the provincial-level People's Councils (for local roads) so that the latter stop the toll deduction for capital recovery and at the same time issue decisions on toll collection, remittance and use management according to the regimes prescribed for roads invested with state budget capital as mentioned above.

5. Units organizing the collection of tolls on roads invested by the State with loan capital and collection of tolls for capital recovery shall have to make estimates, observe the estimates and toll revenue-expenditure settlements according to regulations applicable to roads invested with the state budget capital mentioned at Points 5, 6, 7 and 8, Section I of this Part. Besides, they must also explain in detail the payable debts (principals and interests), amounts already repaid by the reporting year, amounts payable in the estimating year and payment source of the estimating year.

6. For roads invested by the State with loan capital for upgrading mentioned in this Section, after the full repayment of loan capital (including both principals and interests), tolls must be collected, remitted, managed and used according to the regime prescribed for roads invested with state budget capital mentioned above.

### **III. ROAD INVESTED BY JOINT-VENTURE CAPITAL**

1. Road invested by joint-venture capital, including:

- Road invested by joint-venture capital of State budget and other partner.

- Road invested apart by State (a bridge on the road section or a part of road in section), the rest part invested by other partner. In this case, both sides have to assess the real value of road section to determine the capital distribution of each side.

2. toll rate invested by joint-venture is considered as road-using charges inclusive of VAT for use of roads, which are set by the MOF (for national highways) or provincial People's

Councils (for local roads), suitable to the road grade and the length of the toll road sections under the approved investment projects and investors' proposal, which, however, shall not exceed twice the toll rates for roads invested with state budget capital. The toll-setting procedures and order shall comply with the provisions of Point 2, Section II of this Part.

3. Collected fee from road invested joint-venture capital will be used as follows:

3.1. Pay VAT and business income tax as current regulations.

3.2. Pay expenses for toll organization.

3.3. Pay for management, maintenance the road section

3.4. The total amount of collected fee, after subtracting the amounts specified in (3.1, 3.2, 3.3), the remaining amount 100% will be given to both sides (to shorten toll collection time of road invested by joint-venture) or divided to partners in portion of capital contribution in projects which approved by authorities under the following regulation:

a) The amount of collected fee which divided in portion of capital contribution of State budget, have to be sent to State budget (if invested by the central budget, shall be remitted to central budget; if invested by local budget, shall be remitted to local budget; in case, both central and local budget contribute, shall be divided in portion of capital contribution each side)

b) The amount of collected fee which divided in portion of capital contribution of other partners will be accounted in income of unit and won't be taxable income business.

4. Road invested by joint-venture capital mentioned in this section after returning fully capital, expenses related above (including allowed profit) under the approved investment projects, shall implement the collection, remittance, management according to regulations of road invested by State budget capital above.

**IV.ROAD INVESTED FOR BUSINESS**

1. The toll rates for roads invested for business (including BOT and other forms of business) are road-using charges inclusive of VAT for use of roads, which are set by the MOF (for national highways) or provincial People's Councils (for local roads), suitable to the road grade and the length of the toll road sections under the approved investment projects and investors' proposal, which, however, shall not exceed twice the toll rates for roads invested with state budget capital. The toll-setting procedures and order shall comply with the provisions of Point 2, Section II of this Part.

2. The road toll amounts invested for business are business revenues of units. Toll collection operator have to declare and pay value added tax and business income tax, and account business results as provided by law.

3. At the end of the business duration under contracts or decisions of competent state bodies, investors must transfer such roads to the State for management and the toll collection

operator must collect, remit, manage and use road tolls according to the regulations specified for roads invested with state budget capital as mentioned above.

**PART III**  
**TOLL COLLECTION DOCUMENTS AND RESPONSIBILITIES OF TOLL**  
**COLLECTION ORGANIZATIONS**

**I. Road toll collection documents**

1. The toll collection documents are referred as tickets. The toll tickets are provided differently:

a) The toll tickets for roads invested with the state budget capital and the State's loan capital for upgrading, subject to toll collection for capital redemption (Section I, Section II, Part II of this Circular) are titled "road toll". The road toll vouchers are receipt of tolls belonging to the state budget.

b) The toll tickets for roads invested for business (section III, section IV, part II of this Circular) are titled: "Road charge". "Road charge" vouchers are the specific invoices which are used when supplying the road using services.

2. Types of toll ticket:

2.1. The toll tickets at each toll station shall include single trip ticket, monthly ticket, quarterly ticket

a) The toll station tickets has the following common characteristics:

- Toll station tickets are used for collection of tolls from means participating in traffic through a toll station where tickets are issued. The toll tickets issued for any toll station shall be valid for use only at such toll station (not valid at other toll stations ).

- Tickets are printed according to set forms of the MOF (General Department of Taxation) with uniform sizes and common norms (excluding types of toll tickets at automatic and semi-automatic toll stations ).

- Tickets are issued annually according to the calendar year. Single trip tickets shall be used continuously through years. The monthly tickets and quarterly tickets shall be valid only within the duration inscribed in the tickets. The sold tickets must not be changed or returned (including damaged tickets and expired tickets).

- Single trip tickets are sold according to traffic means corresponding to the par values pre-printed on the tickets, not inscribed with plate numbers of traffic means. Monthly tickets and quarterly tickets are sold according to traffic means corresponding to the par values pre-printed on the tickets, which are, however, must be inscribed clearly with the use duration and plate numbers of traffic means.

- Single trip tickets, monthly tickets and quarterly tickets at each toll station are widely sold to all subjects that have demands. Organizations and individuals may buy one or many tickets at a time for use.

b) Specific characteristics of each type of toll ticket:

- Single trip tickets: Used for collection of tolls on traffic means passing through toll stations where tickets are issued. Single trip tickets are pre-printed with par values according to toll rate prescribed for each type of traffic means.

- Monthly tickets: Used for collection of tolls on traffic means passing through toll stations where tickets are issued within a month starting from the first day to the last day of the month inscribed in the tickets.

Monthly tickets are pre-printed with par value corresponding to each type of traffic means. The par value of a monthly ticket shall be 30 times the par value of a single trip ticket. Particularly, the par value of monthly tickets for two wheelers, three wheelers, mopeds and the like shall be ten times the par value of the single trip ticket.

- Quarterly tickets: Issued according to quarter (I, II, III, IV) in the calendar year, used for collection of tolls on traffic means passing through toll stations where tickets are issued within a quarter starting from the first day of the first month of such quarter to the last day of the quarter inscribed in the tickets.

Quarterly tickets are pre-printed with par values corresponding to each type of traffic means. The par value of a quarterly ticket shall be three times the par value of a monthly ticket, with 10% discount (to encourage the purchase of quarterly tickets).

## 2.2. Highway 5 toll tickets:

To experimentally use Highway 5 toll tickets at two toll stations with monthly tickets and quarterly tickets (single trip tickets shall not be used, which, however, can be bought at each toll booth, if needed).

a) The Highway 5 toll tickets bear the following common characteristics:

- Highway 5 toll tickets are titled “Highway 5 charge”, concrete notes: use duration, vehicle type, license plate, charge level.

- Highway 5 toll tickets are used for means (excluding two-wheelers, three-wheelers, mopeds and the similar one) joining in traffic on Highway 5. The Highway 5 toll tickets shall not be valid for use on other roads.

- The par value of a Highway 5 toll ticket is equal to a booth toll ticket par value multiplied by 2.

- The Highway 5 toll tickets are uniformly prescribed by the MOF in terms of sizes, colors and norm contents.

- The Highway 5 toll tickets are sold widely to all subjects, without restrictions on quantity. The means operators using Highway 5 toll tickets shall put up the tickets inside the front wind shields for ticket check upon each time the means pass through the toll booth.

b) Specific characteristics of each type of Highway 5 toll ticket shall be as follows:

- Monthly tickets: Used for the collection of tolls on means participating in traffic on Highway 5 within a month duration inscribed in the tickets.

A monthly highway 5 toll ticket par value = A monthly booth toll ticket par value x 2

- Quarterly tickets: Used for the collection of tolls on means participating in traffic on Highway 5 within a quarter duration inscribed in the tickets.

A quarterly highway 5 toll ticket par value = A quarterly booth toll ticket par value x 2

c) The par values of assorted booth toll tickets and Highway 5 toll tickets are specified in the Appendix to this Circular.

### 2.3. The national highway single trip tickets:

- A national highway single trip ticket has the par value of VND 10,000/ticket/trip, applicable to cars of less than 12 seats and valid for toll stations managed by the State (including national highway toll stations assigned to localities for toll collection). The national highway single trip tickets shall not apply to toll stations invested for business (BOT or other business form), regardless of national highways or local roads; toll stations managed by localities (local roads) and toll stations with toll collection rights already transferred for a definite term.
- A national highway single trip ticket shall be valid only for one trip through a national highway toll booth. Organizations and individuals using cars of less than 12 seats can buy national highway single trip tickets as requested (without restriction on quantity) at any national highway toll station most convenient and each time passing through a national highway toll booth, the means operators shall produce one ticket.
- The MOF (General Department of Taxation) shall print and issue national highway single trip tickets according to a set form. A ticket is composed of three parts: The counterfoil, the part kept by ticket control gates and the part kept by toll payers (for use as payment voucher), which are made with the contents, colors and sizes as prescribed.
- Toll stations shall have to sell national highway single trip tickets to all subjects in need; settle tickets and toll money according to current regulations.
- The toll collection operator shall collect, remit (into the state budget or into sources created for capital recovery) and manage the use of proceeds from the sale of national highway single trip tickets according to current regulations.

### 2.4. The nationwide road ticket

- Tickets used exclusively for defense and police vehicles have the title: nation wide road ticket. The defense and police units have the nationwide road ticket that means they have paid charges at all the toll station in the whole country ( not distinguish the toll station invested by the State or by BOT and other forms) according to the issued par value attached to this Circular.
- The nationwide road tickets applicable to defense vehicles include the following contents: The issuing agency (The MOF -General Department of Taxation), type of vehicle with two types of ticket used separately for military cars and military trucks (without details on tonnage and plate numbers of each means), the expiry year (not inscribed with par values). A ticket sizes of 12 x 8 cm and has the colors: red for the background, white for letters and numerals. The nationwide road tickets applicable to the Ministry of Defense 's vehicles bearing red number plates shall not be used for means bearing other number plates (including the Ministry of Defense 's means which do not bear red number plates). Ticket controllers at toll stations shall recognize types of the Ministry of Defense 's means for which road tolls have been already paid through two basic characteristics: the red number plates and nation wide road

charge (nationwide road toll) tickets; in cases where traffic means lack either of these two characteristics, they shall be considered as having not paid the road tolls.

- The nationwide road tickets applicable to defense vehicles include the following contents: The issuing agency (The MOF -General Department of Taxation), using vehicle type includes 5 types (according to the collecting graph enclosed to this Circular). Tickets dimension has the size of 12 x 8 cm and the colors as: yellow ticket with the red line along to the ticket at the position of 1/3 of the ticket from the left to right, black letter and number.

- The nationwide road tickets are not allowed to use as the expense payment vouchers (including budget and services business expenses).

### 3. Printing, issuance and use management of road toll tickets:

#### 3.1. Ticket forms:

Road toll ticket forms are used to distinguish between two types of ticket:

- Magnetic tickets used for automatic or semi-automatic toll collection and printed in forms suitable to different types of machine manufactured by different firms.

- Non-magnetic tickets used for manual toll collection and printed according to set forms uniformly designed by the MOF (General Department of Taxation) in cooperation with the Transport Ministry in terms of sizes and norm contents.

Based on the ticket forms prescribed by the MOF, the provincial/municipal Tax Departments shall assume the prime responsibility for, and coordinate with units tasked to organize the toll collection in, determining specific norms applicable at toll stations and the color of each type of ticket shall be provided for by localities. The principles for determining the ticket forms shall be as follows:

#### a) Ticket size (excluding magnetic tickets):

- Single-trip ticket, composed of three parts: The counterfoil, the part to be at ticket control gates, the part to be kept by toll payers (for ticket control and use as payment vouchers), with the ticket size of 19 x 7 cm (excluding section for the back of the receipt volumes).

- Toll station monthly or quarterly ticket, composed of two parts: The counterfoil and the part to be kept by toll payers (for ticket control and use as payment vouchers), with the ticket size of 9 x 6 cm (excluding section for the back of the receipt volumes).

- Highway 5 monthly, quarterly ticket, composed of two parts: The counterfoil and the part to be kept by toll payers (for ticket control and use as payment vouchers), with the ticket size of 28 x 12 cm (excluding section for the back of the receipt volumes). Particularly, the monthly toll tickets for motorbikes have the same sizes as the booth monthly tickets for motorbikes (mentioned in the above part).

#### b) Ticket color:

- The booth single-trip, monthly, quarterly toll tickets are printed in 7 different colors corresponding to 7 par values (each color for each par value), which are determined properly by Provincial/Municipal Tax Departments in cooperation with units tasked to organize the toll collection.

- The highway 5 monthly, quarterly toll ticket is divided into two parts: The upper part is in light bright color and the lower part is in dark color (each color for each par value).

c) Details to be inscribed on tickets:

Details to be inscribed on tickets shall be provided uniformly, containing such basic norms as the issuing unit, type of ticket, type of traffic means, use duration, ticket par value.

### 3.2. Ticket printing and issuance

a) The General Department of Taxation shall print and issue Highway 5 monthly and quarterly tickets, national highway single-trip tickets and tickets for traffic means of the Ministry of Defense and the Ministry of Public Security, specifically:

- Annually or extraordinarily, the General Department of Taxation must sum up the use demands of units for adequate printing and issuance of assorted necessary tickets to provincial/municipal Tax Departments for timely delivery to toll collection operator for sale to users according to regulations.

- To sell nationwide road toll tickets at the request of the Ministry of Defense and the Ministry of Public Security and send notices on road toll payment by the Ministry of Defense, the Ministry of Public Security to Directorate for roads of Vietnam for sum-up of, and report on, toll collection results.

b) The provincial/municipal Tax Departments shall print and issue single-trip tickets, monthly tickets and quarterly tickets for toll collection by toll stations based in the localities (national highways, local roads, BOT roads and other roads), receive Highway 5 toll tickets and national highway single-trip tickets, which are printed by the General Department of Taxation, for supply to toll stations for sale to users.

Annually, quarterly or extraordinarily, the provincial/municipal Tax Departments shall make sum-up reports on demands for each type of ticket, forwarded by units tasked to organize the toll collection, compare them with the volume of stock tickets which can be continually used (if any), determine the quantity of assorted tickets to be printed in the period so as to print them adequately and timely, satisfying the use demands, not letting the situation of ticket shortage occur while saving expenditures. For tickets to be printed and issued by the General Department of Tax, the provincial/municipal Tax Departments must sum up reports on estimation of the necessary ticket volume and propose the General Department of Taxation to print them in accordance with the practical requirements.

c) Units tasked to organize toll collection must:

- Annually, before the 15<sup>th</sup> day of the first month of the last quarter of the current year, or extraordinarily (due to ticket shortage or change in demands...), estimate the ticket volumes (detailed to each type of ticket) needed for use in the following year or period (for extraordinary cases) and send report to the superior road-managing companies (for toll stations), and the direct managing Tax Departments for timely printing of tickets to satisfy the use demand in the period.

- Receive assorted tickets at Provincial/Municipal Tax Departments for sale to users according to regulations (excluding the nationwide road toll)

- Regularly monitor opinions of units on the use demand for each type of ticket, the detailed norms on the tickets; if they are inappropriate, report them in time to the superior managing agencies and the direct managing tax agencies for appropriate adjustment.



### 3.3. Ticket management and use:

a) The road toll tickets for roads invested with the state budget capital or loan capital for capital recovery as provided for in Section I, Section II, Part II of this Circular shall be managed and used according to the MOF's regulations on management of charge and fee collection receipts. Organizations and individuals having road toll ticket (excluding nation wide road toll ticket) are paid the road expense amount (printed on the ticket) on business expenses (for the service business units) or administrative expenses.

b) The road-using charge tickets for roads invested for business as provided for in Section III, Section IV of this Circular shall be managed and used according to the MOF's regulations on management of invoices and vouchers. Organizations and individuals having road toll tickets are paid on business or administrative expenses.

For manufacturing and business units which pay value added tax by tax deduction method, road toll shall be accounted into business expenses and be deducted the value added tax according to the regulations of the value added tax law. For business units which pay value added tax directly on the value added account into business expenses the whole road toll amount, including the value added tax amount.

c) The road toll stations shall have to:

- Settle the ticket volumes and toll amounts collected in each working shift in the day, clearly define the personal responsibility of each working shift on the principle that those who cause the loss of tickets must compensate for the toll money at the corresponding toll rates inscribed on each type of ticket, that those ticket controllers who let vehicles without tickets or with invalid tickets pass through toll stations must compensation for toll money according to regulations. Besides, these persons shall also be fined correspondingly to the seriousness and nature of acts of violation.

- Monthly, quarterly and annually, compare and settle the tickets and settle the collected toll amounts, the amounts remitted into the state budget with the direct managing tax agencies.

### 3.4. Liquidation and destruction of toll tickets:

a) The parts of the toll tickets already sold to users, which are kept at the ticket control gates shall be liquidated and destroyed daily according to working shifts after comparing them with vehicle-counting machines or the ticket-selling sections, and the records thereon shall be signed by the ticket-selling section, the ticket-controlling section and the head of the toll booth.

b) The single-trip ticket counterfoils kept at units assigned to organize the toll collection shall be liquidated and destroyed after three months from the month the tickets are sold to users.

c) The monthly ticket counterfoils shall be liquidated and destroyed after six months from the month the tickets are used.

d) The quarterly ticket counterfoils shall be liquidated and destroyed after one year from the year the tickets are issued, which is inscribed on the tickets.

The liquidation and destruction of assorted ticket counterfoils as mentioned in Items b, c and d above must be decided in writing by directors of the toll road management companies and the liquidation and destruction must be recorded in writing with the participation of the direct

managing tax agencies in strict accordance with the procedures prescribed for liquidation and destruction of tax receipts and prints.

Particularly, the ticket parts kept at the ticket control gates shall be liquidated and destroyed daily according to working shifts after making comparison with the ticket-selling section (with records signed between the two sections); the toll station heads shall decide on the liquidation and destruction and bear responsibility.

4. For motorized vehicles of the Ministry of Defense and the police forces, which participate in road traffic:

The Ministry of Defense's vehicles bearing red number plates, which are liable to road tolls and a number of traffic means of the police forces, when performing urgent and/or special tasks or operations, shall pay road tolls according to the following regulations:

a) Annually, simultaneously with the budget estimation, the Ministry of Defense and the Ministry of Public security shall estimate the volumes and types of ticket needed and the funding amounts for ticket purchase for the plan year and send them to the MOF (General Department of Taxation and Department I).

b) The General Department of Taxation shall print and issue the nationwide road toll tickets exclusively for defense and police vehicles.

c) The Ministry of Defense and the Ministry of Public security shall purchase nationwide road toll according to the regulations:

- When the time for ticket purchase comes, ticket purchasers shall bring introduction papers of the Ministry of Defense or the Ministry of Public security, which are clearly inscribed with their full names and positions; the volumes and types of ticket to be purchased, together with their identify cards to the General Department of Taxation for ticket purchases.

- The General department of Taxation shall supply tickets to the purchases with volumes and types of the nationwide road toll as the request. Based on the issued tickets volume, the General Department of Taxation has to calculate the toll amount and define the time as well as the site to collect the money for the State budget. The announcement must be signed, stamped by the director of Taxation and the receiver has to confirm the volume, sign and write his full name. The toll payment announcement document must have 5 copies: 1 to the Ministry of Defense or Ministry of Public Security, 1 to the Central State Treasury, 1 to office I – the ministry of Finance, 2 copies to keep as archives at the General Department of Taxation.

- Based on the toll payment notices of the General Department of Taxation, the Ministry of Defense and the Ministry of Public Security shall carry out the procedures for money remittance into the state budget according to regulations. After receiving the money payment receipts of the Ministry of Defense or the Ministry of Public Security, the Central State Treasury shall carry out procedures for collection of money and account them as follows:

+ Deducting 20% into the account of Directorate for roads of Vietnam, of which 15% (equal to 75% of the total deducted amount) for reward to persons who have detected forgery tickets (the reward to persons who have detected forgery tickets shall comply with the separate guidance of the MOF). At year-end, if such amount is not used up, the remainder shall be transferred to the following year for further use and must be annually settled with the MOF. In

cases where such amount is not used up for three consecutive years, the remainder must be transferred into the investment funds for modernization of toll-collecting technology; 5% (equal to 25% of the total deducted amount) shall be added to the investment fund for modernization of toll-collecting technology;

+ The remaining 80% shall be accounted into the state budget at the Central State Treasury according to corresponding chapter, category, clauses, section 036,

- The Central State Treasury shall, after receiving the money payment vouchers and the toll amounts already paid into the state budget by the Ministry of Defense or the Ministry of Public security, make certification of having already collected the road tolls in the payment vouchers of the Ministry of Defense or the Ministry of Public security and issue notice on state budget credit according to the prescribed procedures.

The toll payment papers with the Central State Treasury's certification of having already collected road tolls shall be used as vouchers for settlement of defense or public security budget.

- Periodically, the Ministry of Defense and the Ministry of Public security shall compare with the General Department of Taxation the payable toll amounts, the toll amounts already paid into the state budget and the toll amounts to be further paid or overpaid in order to settle them according to actual payment.

d) The funding sources for payment of tolls on traffic means in service of the tasks of commanding, training and/or combat readiness of the Ministry of Defense and the Ministry of Public security shall be allocated by the state budget according to the approved annual estimates.

## **II. Responsibilities of toll collecting organizations and individuals**

Road toll-collecting organizations and individuals (hereinafter referred collectively to as road toll-collecting units) shall have the responsibilities:

1. To publicize announcements (including the posting up at ticket-selling places) on subjects liable to pay tolls, subjects entitled to toll exemption, the toll rates and procedures for toll collection and remittance.

2. To organize convenient ticket-selling locations according to regulations:

a) To organize ticket selling spots at toll stations, which are convenient for traffic means operators and free from traffic jam. In addition, the toll collection units need to expand the ticket selling network and forms in order to help people more convenient when buying tickets and ensure the management, avoid loss off charge.

b) To sell assorted tickets in time and adequately at the request of buyers, without any restriction on the subjects and volumes of tickets. For single-trip tickets sold at the ticket par values corresponding to tonnage of traffic means, not to specify the number plates of traffic means and the use duration. For monthly and quarterly tickets, to sell them according to the following regulations:

- Organizations and individuals buying tickets must produce to ticket sellers the registration certificates of traffic means for purchase of tickets at the toll rates corresponding to types of traffic means and their designed load.

- Ticket sellers must fully inscribe on the tickets: the number plates, the use duration.

c) Organizations and individuals buying toll tickets shall base on their practical conditions to select the mode of payment in cash, cheque, account transfer or accreditation expenditure by deducting money from buyers' accounts for transfer into toll-collecting units' accounts.

- The sold tickets (including booth tickets, Highway 5 toll tickets, national highway single-trip tickets and nationwide road toll ticket) must not be changed or returned, including cases where tickets expired, and damaged or become non-magnetic and invalid for passage through ticket control gates.

- Road toll tickets serve as vouchers for control of traffic means when passing through toll stations and also as vouchers for payment (excluding the nationwide road ticket).

3. To strictly control traffic means passing through toll stations according to regulations:

a) To control traffic means passing through toll stations around the clock and handle as follows:

- For traffic means liable to pay road tolls, the means operators must produce tickets according to regulations. In case of producing tickets in contravention of regulations or using forgery tickets, they are not allowed to pass through the toll stations and shall also be handled for violations according to the provisions of law.

The ticket controllers who detect acts of ticket fraudulence (having no tickets, using forgery tickets or tickets not corresponding to tonnage, type of traffic means...) shall have to transfer the subjects to competent sections for handling without delay which may cause traffic jam.

- For traffic means entitled to toll exemption as provided for at Point 4, Section II, Part I of this Circular, the ticket controllers shall base on the identification characteristics of each corresponding vehicle (specialized defense vehicles, fire engines, ambulances, motorcade, vehicles carrying accident victims...), to handle specifically the right objects, avoiding negative phenomena, abusing situation or causing difficulties to means operators.

b) To unexpectedly check traffic means using tickets in order to discover forgery tickets, ticket frauds and handle them according to competence or transfer the cases to competent agencies for handling according to the provisions of law. The checks must comply with

c) To strictly prohibit all cases of receiving road tolls from means operators without giving them tickets, or permitting traffic means liable to pay tolls but having no toll tickets to pass through toll stations, colluding in toll evasion, toll embezzlement, causing toll loss.

4. To handle administrative violations of subjects that commit acts of toll fraudulence according to competence or transfer to competent agencies for handling cases of violating legislation on toll payment and toll ticket use according to the provisions of law.

5. Within 30 days before commencing the toll collection, the toll collection operator must register the road toll collection with the Provincial/Municipal Tax Departments of the localities where toll stations are located in terms of toll station locations, types and quantity of toll tickets needed.

Monthly, they must declare the collected toll amounts, the amounts payable to the state budget (toll or tax money) and submit the declarations to the direct managing Provincial/Municipal Tax Departments within the first five days of the following month. The declaration must be made in full and according to a set form and declares must bear responsibility for the accuracy of the declared data as provided for by law.

6. To remit the road toll amounts (for roads invested with state budget capital) or payable taxes into the state budget (for roads invested for business) within the time limit provided for by law.

7. To follow the regulations of accounting and settling road tolls according to regulations:

- To open accounting books for monitoring the collected and remitted toll amounts and the management of toll use according to the State's current accounting regulations.

- To manage and use road toll tickets and relevant vouchers according to the MOF's regulations on management of invoices and vouchers.

- To settle road tolls according to calendar year. The time limit for toll collection operator to submit the settlements to tax agencies shall be 60 days as from December 31 of the toll - settlement year. The toll settlement must fully reflect the entire collected toll amount, the payable toll or tax amounts, the amounts already remitted into the state budget, the amount retained for expenditures, the amounts to be additionally remitted into the state budget or over remitted up to the time of toll settlement.

The toll collection operator shall have to fully remit the outstanding toll or tax amounts into the state budget within 10 days as from the date of submitting the toll settlement reports; in case of overpayment, the overpaid amounts shall be deducted from the amount payable in the following period and they must bear responsibility for the truthfulness of the data in the toll settlement; if units give false reports to evade toll payment or commit fraudulence related to state budget money, they shall be sanctioned according to the provisions of law.

- To fully supply documents, books, invoices and accounting vouchers related to management of tolls and/or taxes at the request of tax agencies.

### **III. Responsibilities of Tax agencies**

Tax agencies shall have the responsibilities:

1. To guide and urge the toll collection operator to declare, collect, remit, open books and accounting vouchers on, and to settle road tolls according to the provisions of law on charges and fees and the specific provisions of this Circular.

2. The General Department of Taxation shall coordinate with Directorate for roads of Vietnam, the provincial/municipal Tax Departments shall coordinate with the provincial/municipal Transport Services as well as toll collection operator in localities in studying and designing forms of vouchers and prints in service of toll collection; organize the printing, issuance and management of toll collection documents strictly according to the MOF's regulations on management of prints, ensuring the timely and adequate supply of toll collection documents to toll collection operator for sale to users at their requests. Besides, the General Department of Taxation shall also have to bear responsibility for selling the nationwide road toll tickets applicable to motorized vehicles of the Ministry of Defense and the Ministry of Public security, open books to monitor and urge the road toll payment by the Ministry of Defense and the Ministry of Public security into the state budget according to regulations.

3. To examine and inspect the declaration, collection, remittance and settlement of road tolls; to handle administrative violations in the observance of the regulation of registration,

declaration and remittance of tolls into the state budget, the regulation of opening accounting books, managing the use and archive of toll collection documents .

#### **Part IV. Handling of violations**

1. If traffic means operators, when passing through toll stations , commit acts of toll fraudulence (failing to buy toll tickets, using forgery tickets, falsifying tickets or agreeing on toll fraud, etc), they shall, apart from fully paying toll amounts at the toll rates provided for in this Circular, be sanctioned for administrative violations according to current provisions of law.

The handling of violations must comply with the procedural order provided for by law. In cases where fines are collected, fine receipts inscribed with the collected amount (the receipt of the type issued by the MOF) must be issued to fine payers.

2. Toll collection operator and individuals that violate the regulations of toll and fine collection and remittance; the regulation of toll declaration and remittance into the state budget; the toll accounting and settling regulations, shall be handled according to the provisions of law on charges and fees and the relevant provisions of law.

#### **Part V: Organization of implementation**

1. This Circular shall take effect 15 days after its publication in gazette.

This Circular shall replace: Circular No. 109/2002/TT-BTC of December 6, 2002 of the MOF providing the regulation of road toll collection, remittance and use management; Circular No. 01/2003/TT-BTC of January 7, 2003 of the MOF amending the charge rates for use of roads by military vehicles of the Ministry of Defense ; Circular No. 12/2003/TT-BTC of February 18, 2003 of the MOF guiding the supplementation of Circular No. 109/2002/TT-BTC of December 6, 2002 of the MOF providing the regulation of collection, remittance and management of road-using charges; Circular No. 52/2003/TT-BTC of May 30, 2003 of the MOF amending and supplementing Circular No. 109/2002/TT-BTC on road-using charges, and official Letter No. 4269-TC/TCT of April 28, 2003 on the issuance of road toll tickets.

The MOF's previous regulations on road-using charges, which are contrary to those of this Circular, will cease to be effective.

2. Based on the toll rates specified in this Circular, the Transport Ministry and the provincial/municipal People's Councils shall, according to their respective competence, notify, direct the toll collection operator under their management to collect road tolls according to the provisions of this Circular.

If any problems arise in the course of implementation, organizations and individuals are requested to report them in time to the MOF for study and additional guidance.

## TOLL COLLECTION INVESTED BY STATE BUDGET CAPITAL

*(Issued together with Circular No 90/2004/TT-BTC dated September 7<sup>th</sup> 2004 by the Ministry of Finance)*

No	Vehicles	Par value		
		Times ticket (vnd/ticket/time)	Monthly ticket (vnd/ticket/time)	Quarterly ticket (vnd/ticket/time)
1	2 wheels motorcycle, 3 wheels motorcycle, motorbike and similar vehicles.	1.000	10.000	
2	Xe lam / tuk tuk (3 wheel vehicle), farm vehicle, tractor	4.000	120.000	300.000
3	Less than 12 – seat car, load under 2 - ton truck and public buses	10.000	300.000	800.000
4	12 - 30 seat car, load from 2 to under 4 tons truck.	15.000	450.000	1.200.000
5	More than 31 – seat car, load from 4 to under 10 tons truck.	22.000	660.000	1.800.000
6	Load from 10 to under 18 tons truck and 20 feet container truck	40.000	1.200.000	3.200.000
7	Load more than 18 ton truck and 40 feet container truck	80.000	2.400.000	6.500.000

Note:

- Load capacity of each vehicle applied the above par value according to the design load.
- For the application of charge for lorry with containers (including specialized tractor-trailer): application of charge base on design load vehicle, non – discrimination carrying goods or not vehicle, carrying goods by container wich has load under the design load still applied the charge according to the design load of vehicles.

### TOLL LEVEL AT NATIONAL HIGHWAY No.3

*(Issued together with Circular No 90/2004/TT-BTC dated September 7<sup>th</sup> 2004 by the Ministry of Finance)*

No	Vehicles	Par value	
		Monthly ticket (vnd/ticket/time)	Quarterly ticket (vnd/ticket/time)
1	2 wheels motorcycle, 3 wheels motorcycle, motorbike and similar vehicles.	20.000	
2	Xe lam / tuk tuk (3 wheel vehicle), farm vehicle, tractor	240.000	600.000
3	Less than 12 – seat car, load under 2 - ton truck and public buses	600.000	1.600.000
4	12 - 30 seat car, load from 2 to under 4 tons truck.	900.000	2.400.000
5	More than 31 – seat car, load from 4 to under 10 tons truck.	1.320.000	3.600.000
6	Load from 10 to under 18 tons truck and 20 feet container truck	2.400.000	6.400.000
7	Load more than 18 ton truck and 40 feet container truck	4.800.000	13.000.000

Note:

- Load capacity of each vehicle applied the above par value according to the design load.
- For the application of charge for lorry with containers (including specialized tractor-trailer): application of charge base on design load vehicle, non – discrimination carrying goods or not vehicle, carrying goods by container wich has load under the design load still applied the charge according to the design load of vehicles.



**Toll level applied to The national defense's vehicles – which have compressed license plate, submerged stamped white numbers and letters**

*(Issued together with Circular No 90/2004/TT-BTC dated September 7<sup>th</sup> 2004 by the Ministry of Finance)*

<b>No</b>	<b>Vehicle</b>	<b>Annually ticket (vnd/ticket/year)</b>
<b>1</b>	<b>Millitary car</b>	
	- Level 1:	2.000.000
	- Level 2:	1.000.000
<b>2</b>	<b>Millitary transport</b>	
	- Level 1:	3.000.000
	- Level 2	1.500.000

### **Toll collection level applied to Public security's vehicles**

*(Issued together with Circular No 90/2004/TT-BTC dated September 7<sup>th</sup> 2004 by the Ministry of Finance)*

<b>No</b>	<b>Vehicle</b>	<b>Annually ticket (vnd/ticket/year)</b>
1	Less than 7 seat car	
2	More than 7 seat car	1.000.000
3	Specialized vehicles, including: field investigation car, information car, specialized mobile communication car	1.500.000
		2.000.000
		3.000.000
4	Transport car	200.000
5	2 wheels vehicles, 3 wheels vehicles	

**3.9 No. 36/2009/TT-BTTTT (CIRCULAR): Stipulating specifications and exploiting conditions of short range Radio Frequency Devices of conditional use**

Hanoi, December 03<sup>rd</sup>, 2009

**CIRCULAR**  
**Stipulating specifications and exploiting conditions of  
short range Radio Frequency Devices of conditional use**

**MINISTER OF MINISTRY OF INFORMATION AND COMMUNICATION**

Persuant to State law on Post and Communications dated May 25<sup>th</sup>, 2002;  
Persuant to Decree No. 24/2004/NĐ-CP dated January 14<sup>th</sup>, 2004 by Government on  
implementation details issues of State law on Post and Communications on Radio  
Frequency;

Persuant to Decree No. 187/2007/NĐ-CP dated December 25<sup>th</sup>, 2007 by Government on  
functions, duties, authorities and organization of Ministry of Information and  
Communications;

On the request of Director of Radio Frequency Directorate;

**MAKE REGULATIONS**

**Article 1. Scope of regulations and applications objects**

This Circular stipulates specifications and exploiting conditions of short range Radio  
Frequency with limited capacity, less harmful interference of conditional use .  
This Circular apply for organizations, individuals taking part in management, using, producing,  
importing, trading short range Radio Frequency Devices of conditional use .

**Article 2. General conditions**

1. Short range Radio Frequency Devices comply with specifications and exploiting  
conditions in correspondant Appendixes (from Appendix 1 to 10) of this Circular is of  
conditional use and require no Radio Frequency permit.

2. For Radio Frequency Devices don't meet specifications and exploiting conditions in  
correspondant Appendixes (From number 1 to 10) in this Circular, only with Radio Frequency  
permits that they can be used by organizations, individuals.

3. Short range Radio Frequency Devices are not allowed to cause harmful interference  
to the others which have got Radio Frequency permits, and which are allowed to operate and  
have to accept interference from other Radio Frequency Devices.

In case short range Radio Frequency devices cause harmful interference, organizations,  
individuals have to stop using immediately and are able to reoperate ony when interference  
has been recovered.

4. Short range Radio Frequency Devices have to accept interference from industrial,  
scientific and medical (ISM) application device when using the same following Frequency  
bands for ISM:

- a) Frequency band 13.553 + 13.567 MHz;
- b) Frequency band 20.967 + 27.283 MHz;

- c) Frequency band 40.66 + 40.70 MHz;
- d) Frequency band 2400 + 25000 MHz;
- e) Frequency band 5725 + 5875 MHz;
- f) Frequency band 24000 + 24500 MHz;

5. Production, import short range Radio Frequency Devices of Conditional use have to comply with regulations of law on import, certificate and disclosure.

6. Short range Radio Frequency Devices of Conditional use has to comply with conditions on frequency and emission phase stipulated at Appendix 1 of this Circular.

### **Article 3. Specifications and exploiting conditions for specific Radio Frequency Devices**

Specifications and exploiting conditions for specific Radio Frequency Devices are stipulated in following Appendixes of this Circular:

- Appendix 2: Wireless telephones
- Phụ lục 3: Medical Implant Communication Systems (MICS) and Medical Implant Telemetry Systems (MITS) Devices
- Appendix 4: Radio Frequency Identification Device (RFID) Devices
- Appendix 5: Radio Frequency warning and detecting Devices
- Appendix 6: Wireless Audio Devices
- Appendix 7: Radio Frequency Remote Control Devices
- Appendix 8: Wireless Local Area Network (WLAN) Devices
- Appendix 9: Radio Frequency Telemetry Devices
- Appendix 10: Wireless Transmitting Devices

### **Article 4. Implementation**

1. This Circular comes into effect from February 1<sup>st</sup>, 2010 and replaces Decision No. 47/2006/QĐ-BBCVT dated November 29, 2006 by Minister of Ministry of Information and Communications on stipulating “Regulations on specifications and exploiting conditions of short range Radio Frequency Devices of Conditional use”.

2. Chief Secretariat, Director of Radio Frequency Directorate, Heads of agencies, units under Ministry of Information and Communications, organizations, individuals to use, produce, import, trade short range Radio Frequency Devices are responsible to implement this Circular.

3. During implementation process, if some problems may occurs, organizations, individuals should inform timely to Ministry of Information and Communications to be instructed or for considering, amending and supplementing./.

**PP. MINISTER  
DEPUTY MINISTER**

**Recipients:**

- As in Term 2 Article 4;
- Ministries, Ministerials Agencies, Agencies under Government;
- People's Committee of provinces and cities under Central;
- Post and Communications Departments of provinces, cities under Central;
- Department of Document Examination (Ministry of Justice);
- Gazette;
- Government's web portal
- Ministry of Information and Communications' web portal;
- As Archieves.

**Lê Nam Thắng**

**APPENDIX 1**

**CONDITIONS ON FREQUENCY AND EMISSION LIMITS FOR SHORT RANGE RADIO  
FREQUENCY OF CONDITIONAL USE**

	<b>FREQUENCY</b>	<b>MAIN EMISSION (Maximum capacity)</b>	<b>SPURIOUS EMISSION (Maximum capacity or minimum emission attenuation)</b>	<b>TYPE OF DEVICES OR APPLICATIONS</b>
	A	B	C	D
1	115 ÷ 150 kHz	≤ 4,5 mW ERP	Accoring to spurious emission limit 1 <sup>i</sup>	Radio Frequency warning and detecting Devices Radio Frequency identification Devices Radio Frequency remote control
2	10,2 ÷ 11 MHz	≤ 4 μW ERP	Accoring to spurious emission limit 1 <sup>i</sup>	Wireless audio Device for hearing aids

3	13,553 ÷ 13,567 MHz	≤ 4,5 mW ERP	According to spurious emission limit 1 <sup>i</sup>	Radio Frequency warning and detecting Devices
				Radio Frequency identification Devices
				Other devices and applications <sup>ii</sup>
4	26,957 ÷ 27,283 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency Remote Control Devices
				Radio Frequency telemetry Devices
				Other devices and applications <sup>ii</sup>
5	29,7 ÷ 30,0 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency Remote Control Devices
				Radio Frequency warning and detecting Devices
				Radio Frequency telemetry Devices
6	34,995 ÷ 35,225 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency Remote Control Devices
7	40,02 ÷ 40,98 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Plane model control Devices (belong to Radio Frequency telemetry Devices)
8	40,66 ÷ 40,7 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Wireless Audio Devices
				Radio Frequency telemetry Devices
				Other devices and applications <sup>ii</sup>
9	40,50 ÷ 41,00 MHz	≤ 10 μW ERP	≥ 32 dBc at the output of the generator	Medical and biological applications (belong to Radio Frequency telemetry Devices)
10	43,71 ÷ 44,00 MHz	≤ 183 μW ERP	≥ 32 dBc at a distance of 3m	Wireless telephones
	46,60 ÷ 46,98 MHz			
	48,75 ÷ 49,51 MHz			

	49,66 ÷ 50MHz			
11	50,01 ÷ 50,99 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Plane model control Devices (belong to Radio Frequency telemetry Devices)
12	72,00 ÷ 72,99 MHz	≤ 1 W ERP	≥ 40 dBc at the output of the generator	Plane model control Devices (belong to Radio Frequency telemetry Devices)
13	88 ÷ 108 MHz	≤ 3 μW ERP	≥ 32 dBc at a distance of 3 m	Wireless Audio Devices (exclude Personal FM transmitters )
		≤ 20 nW ERP		Personal FM transmitters (belong to Wireless Audio Devices )
14	146,35 ÷ 146,5 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency warning and detecting Devices
15	182,025 ÷ 182,975 MHz	≤ 30 mW ERP	≥ 40 dBc at the output of the generator	Wireless Audio Devices
16	216 ÷ 217 MHz	≤ 10 μW ERP	≥ 40 dBc at the output of the generator	Medical and biological applications (belong to Radio Frequency telemetry Devices)
17	217,025 ÷ 217,975 MHz	≤ 30 mW ERP	≥ 40 dBc ở đầu ra của máy phát	Wireless Audio Devices
18	218,025 ÷ 218,475 MHz	≤ 30 mW ERP	≥ 40 dBc at the output of the generator	Wireless Audio Devices
19	240,15 ÷ 240,30 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency warning and detecting Devices
20	300,00 ÷ 300,33 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency warning and detecting Devices
21	312 ÷ 316 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency warning and detecting Devices
				Radio Frequency Remote Control Devices



22	401 ÷ 406 MHz	≤ 25 μW ERP		Medical Implant Communication Systems(MICS)
23	401 ÷ 402 MHz	≤ 100 nW ERP	According to spurious emission limit 2 <sup>iii</sup>	Medical Implant Telemetry Systems(MITS)
	403,5 ÷ 403,8 MHz			
24	433,05 ÷ 434,79 MHz	≤ 10 mW ERP	≥ 32 dBc at a distance of 3m	Radio Frequency Identification Devices
			≥ 40 dBc at the output of the generator	Radio Frequency remote control Devices
				Radio Frequency Telemetry Devices
25	444,4 ÷ 444,8 MHz	≤ 100 mW ERP	≥ 40 dBc at the output of the generator	Radio Frequency warning and detecting Devices
26	470,075 ÷ 470,725	≤ 10 mW ERP	≥ 40 dBc at the output of the generator	Wireless Audio Devices
27	482,19 ÷ 488,00 MHz	≤ 30 mW ERP	≥ 40 dBc at the output of the generator	Wireless Audio Devices
28	821 ÷ 822 MHz	≤ 183 μW ERP	≥ 32 dBc at a distance of 3m	Wireless telephones
29	866 ÷ 868 MHz	≤ 500 mW ERP	≥ 32 dBc at a distance of 3m	Radio Frequency Identification Devices
30	920 ÷ 925 MHz	≤ 50 mW ERP	≥ 32 dBc at a distance of 3m	Radio Frequency Identification Devices
31	924 ÷ 925 MHz	≤ 183 μW ERP	≥ 32 dBc at a distance of 3m	Wireless telephones
32	2400 ÷ 2483,5 MHz	≤ 10 mW EIRP và ≤ 10 mW/100KHz EIRP đối với thiết bị sử dụng điều chế FHSS hoặc ≤ 10 mW/1MHz EIRP đối với thiết bị sử dụng điều chế khác	According to spurious emission limit 4 <sup>v</sup>	Wireless Local Area Network (WLAN)
		10 mW EIRP	According to spurious emission limit 5 <sup>vi</sup>	Other devices and applications <sup>ii</sup> using spread spectrum techniques
				Wireless visual Devices

			According to spurious emission limit 2 <sup>iii</sup>	Other devices and applications <sup>ii</sup>
33	5150 ÷ 5250 MHz	≤ 200 mW EIRP và ≤ 10 mW/MHz	According to spurious emission limit 6 <sup>vii</sup>	Wireless Local Area Network (WLAN)
34	5250 ÷ 5350 MHz	≤ 200 mW EIRP và ≤ 10 mW/MHz	According to spurious emission limit 6 <sup>vii</sup>	Wireless Local Area Network (WLAN)
35	5470 ÷ 5725 MHz	≤ 1 W EIRP và ≤ 50 mW/MHz	According to spurious emission limit 6 <sup>vii</sup>	Wireless Local Area Network (WLAN)
36	5725 ÷ 5850 MHz	≤ 1 mW EIRP và ≤ 50 mW/MHz	According to spurious emission limit 6 <sup>vii</sup>	Wireless Local Area Network (WLAN)
		25 mW EIRP	According to spurious emission limit 2 <sup>iii</sup>	Other devices and applications <sup>ii</sup>
37	10,5 ÷ 10,55 GHz	≤ 100 mW EIRP	According to spurious emission limit 5 <sup>vi</sup>	Wireless visual Devices
38	24 ÷ 24,25 GHz	≤ 100 mW EIRP	According to spurious emission limit 5 <sup>vi</sup>	Wireless visual Devices
				Other devices and applications <sup>ii</sup>

<sup>i</sup> According to spurious emission limit 1: Spurious emission limits are stipulated at 3.2.1 Appendix 4 or 3.2.1 Appendix 5 or 3.2.1 Appendix 7 of this Circular.

<sup>ii</sup> Other devices and applications : short range devices comply exactly with regulations at correspondant columns A, B and C are devices with conditional use including no other specific regulations.

<sup>iii</sup> According to spurious emission limit 2: Spurious emission limits are stipulated at 3.2 Appendix 3 of this Circular.

<sup>iv</sup> According to spurious emission limit 3: Spurious emission limits are stipulated as follows:

- Frequency 47 MHz ≤ f ≤ 74 MHz; 87,5 MHz ≤ f ≤ 118 MHz; 174 MHz ≤ f ≤ 230 MHz; 470 MHz ≤ f ≤ 862 MHz;

+ Operation mode: Spurious emission capacity not exceed: 4 nW

+ Sleep mode: Spurious emission capacity not exceed: 2 nW

- The other frequency smaller than 1000 MHz:

+ Operation mode: Spurious emission capacity not exceed: 250 nW

+ Sleep mode: Spurious emission capacity not exceed: 2 nW

- The other frequency greater than 1000 MHz:

+ Operation mode: Spurious emission capacity not exceed: 1  $\mu$ W

+ Sleep mode: Spurious emission capacity not exceed: 20 nW

<sup>v</sup> According to spurious emission limit 4: Spurious emission limits are stipulated at 3.2.1 Appendix 8 of this Circular.

<sup>vi</sup> According to spurious emission limit 5: Spurious emission limits are stipulated at 3.2.1 Appendix 10 of this Circular.

<sup>vii</sup> According to spurious emission limit 6: Spurious emission limits are stipulated at 3.2.2 Appendix 8 of this Circular.

## APPENDIX 2

### Exploiting condition of wireless phone used with condition

#### 1. Definition

Wireless phone device, including centre block and mobile block are connected by radio waves. Wireless phone device is connected with public phone network via the same two – wire interface.

Centre block (also called base station or base unit) is fixed and two wires connected with the landline publics (PSTN) using integrated antenna. Integrated antenna is a designed and fixed antenna, arranged inside or outside of device and is a part of device.

Mobile block (can be many mobile blocks, or slaves): is handheld phone using integrated antenna. Mobile block using subscribed number of centre block.

In this Appendix wireless phone device excluding mobile terminal of digital cellular mobile information systems and digital mobile information systems or similar, has control channels from central station systems such as CT1, CT2, DECT, WLL.

Wireless phone devices used with conditions at bandwidths specified in paragraph 2 to ensure compliance with the conditions in paragraph 3 and 4 of this Appendix.

#### 2. Conditions of frequency

Wireless phone devices used with conditions at corresponding pair of bandwidths for centre block and mobile block as following:

	Centre block	Mobile block
2.1	43,71 ÷ 44,00 MHz;	48,75 ÷ 49,51 MHz;
2.2	46,60 ÷ 46,98 MHz;	49,66 ÷ 50 MHz;
2.3	821 ÷ 822 MHz.	924 ÷ 925 MHz.

### **3. Conditions of emission**

3.1 Main emission: the emission output doesn't exceed the values corresponding to the bandwidth as follows:

183  $\mu$ W ERP at bandwidths: 43,71 ÷ 44,00 MHz; 48,75 ÷ 49,51 MHz; 46,60 ÷ 46,98 MHz; 49,66 ÷ 50 MHz; 821 ÷ 822 MHz; 924 ÷ 925 MHz.

3.2 Spurious emission:

At bandwidths 43,71 ÷ 44,00 MHz; 48,75 ÷ 49,51 MHz; 46,60 ÷ 46,98 MHz; 49,66 ÷ 50 MHz; 821 ÷ 822 MHz; 924 ÷ 925 MHz; Reduction output of spurious emission with main emission not less than 32dBc at a distance of 3m.

### **4. Other conditions:**

4.1 The wireless phone devices is used only frequency modulation method (F3E) or phase/angle modulation (G3E).

## **APPENDIX 3**

### **TECHNICAL CONDITIONS AND EXPLOITATION FOR MEDICAL IMPLANT COMMUNICATIONS SYSTEMS (MICS), MEDICAL IMPLANT TELEMETRY SYSTEMS (MITS) WITH CONDITION**

#### **1. Definition**

Communication systems for implantable medical devices, hereinafter is MICS (Medical implant communications systems) and measurement systems for implantable medical devices, hereinafter is MITS (Medical Implant telemetry systems), is system including medical device implanted in human body and the radio communication device external to exchange data with the device implanted in the distance 2m, then the data will be transmitted to centre processing and to doctors through telecommunications networks.

In MICS systems, Implant and radio communication devices have two-way data exchange. The MITS system, only one-way data transmission from implantable device to radio communication device at the time pre-programmed.

MICS and MITS devices are used with conditions when operating at bandwidths specified in paragraph 2 in this Appendix shall ensure compliance with the conditions in paragraph 3 and 4 in this Appendix.

#### **2. Conditions of frequency**

2.1. MICS devices operate with condition at bandwidth: 401 ÷ 406 MHz.

2.1.1. Channel range occupied not greater than 300 kHz.

2.1.2. MICS must have at least 9 frequency channels distributed across the 401 ÷ 406 MHz band.

2.2. MITS devices operate with condition at bandwidth: 401 ÷ 402 MHz; 403,5 ÷ 403,8 MHz; 405 ÷ 406 MHz.

### **3. Condition of emission**

3.1. Main emission:

3.1.1. MICS device: ERP output of main emission is not greater than 25  $\mu$ W.

3.1.2. MITS device: ERP output of main emission is not greater than 100 nW.

3.2 Spurious emission

*Operating mode:*

-Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ : 4nW.

-Other frequencies below 1000 MHz: 250 nW.

-The frequencies  $f > 1000 \text{ MHz}$ : 1 $\mu$ W

*Standby mode:*

-Frequency  $f \leq 1000 \text{ MHz}$ : 2 nW.

-Frequency  $f > 1000 \text{ MHz}$ : 20 nW.

### **4. Other conditions:**

4.1 MICS devices have to use transmission protocol after listening (Listen Before Transmit).

4.2 MICS devices only found when there is external control. In emergencies, when detecting the trouble would be dangerous to life or health of patients, MICS devices are allowed to transmit data immediately.

## **APPENDIX 4**

### **TECHNICAL CONDITIONS AND EXPLOITATION FOR RADIO FREQUENCY IDENTIFICATION DEVICE USED WITH CONDITION**

#### **1. Definition**

Radio frequency identification device (RFID – Radio Frequency Identification Device) uses radio waves to automatically identify, track, manage goods, human, animals and other

applications. Radio Frequency Identification Device includes 2 – separated blocks connected through radio interface:

- Radio frequency tag (RF tag) bearing chips, with or without power, are stucked on the object to be identified.

- Reading device (RF Reader) emits certain frequency to enable radio tag and radio tag will generate information of card. This information is collected by reader and transmitted to data processing systems.

Radio frequency identification device used conditionally when operating in bandwidth specified in paragraph 2 in this Appendix, shall ensure compliance with the conditions in paragraph 3 and 4 in this Appendix.

## **2. Conditions of frequencies**

Radio frequency identification device with condition at bandwidths:

2.1. 115 ÷ 150 kHz with centre frequency is 125 kHz và 134,2 kHz;

2.2. 13,553 ÷ 13,567 MHz with centre frequency is 13,56 MHz

2.3. 433,05 ÷ 434,79 MHz with centre frequency is 433,92 MHz.

2.4. 866 ÷ 868 MHz with centre frequency of  $n^{\text{th}}$  channel is calculated by formula:  $865,9 \text{ MHz} + 0,2 \text{ MHz} * n$ ;  $n = 1 \div 10$

2.5. 920 ÷ 925 MHz with the maximum allowable bandwidth of frequency hopping channel in the reduction of 20 dB is 500 kHz.

## **3. Conditions of emission**

3.1. Main emission: the emission output doesn't exceed the values corresponding to the bandwidth as follows:

3.1.1. 4,5 mW ERP at bandwidth 115 ÷ 150 kHz and 13,553 ÷ 13,567 MHz.

3.1.2. 10 mW ERP at bandwidth 433,05 ÷ 434,79 MHz.

3.1.3. 500 mW ERP at bandwidth 866 ÷ 868 MHz; 920 ÷ 925 MHz.

3.2. Spurious emission:

3.2.1. At bandwidth 115 ÷ 150 kHz and 13,553 ÷ 13,567 MHz:

*Operating mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each 27 dB $\mu$ A/m descending 3dB/8 oct.

- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ :  $-3,5 \text{ dB } \mu\text{A/m}$ .
- Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ ;  $4 \text{ nW}$ .
- Other frequencies between 30 MHz and 1000 MHz:  $250 \text{ nW}$

*Standby mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each  $6 \text{ dB } \mu\text{A/m}$  descending  $3 \text{ dB/8 oct}$ .
- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ :  $-24,5 \text{ dB } \mu\text{A/m}$ .
- Frequency  $30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$ :  $2 \text{ nW}$

3.2.2. At  $433,05 \div 434,79 \text{ MHz}$  frequency band;  $866 \div 868 \text{ MHz}$ ;  $920 \div 925 \text{ MHz}$ ; the attenuation of spurious emission compared to main emission not less than  $32 \text{ dBc}$  at a distance of  $3 \text{ m}$ .

#### **4. Other conditions:**

4.1. Radio frequency identification device operates in  $920 \div 925 \text{ MHz}$  bandwidth to use hopping frequency modulation method.

## **APPENDIX 5**

### **TECHNICAL CONDITIONS AND EXPLOITATION FOR WARNING DEVICE AND RADIO DETECTION USED WITH CONDITION**

#### **1. Định nghĩa**

##### **1. Definition**

Warning device and radio detection device includes sensors and control systems are connected through radio interface.

Some kind of warning devices and typical radio detection devices: anti-thief devices, motion detection devices.

Warning devices and radio detection used with condition when operating at bandwidth specified in paragraph 2 in this Appendix shall ensure compliance with the conditions in paragraph 3 in this Appendix.

##### **2. Conditions of frequencies**

Warning devices and radio detection devices used conditionally at bandwidths:

2.1.  $115 \div 150 \text{ kHz}$

2.2. 13,553 ÷ 13,567 MHz

2.3. 29,7 ÷ 30,0 MHz

2.4. 146,35 ÷ 146,5 MHz

2.5. 240,15 ÷ 240,3 MHz

2.6. 300 ÷ 300,33 MHz

2.7. 312 ÷ 316 MHz

2.8. 444,4 ÷ 444,8 MHz

### 3. Conditions of emission

3.1. Main emission: the emission output doesn't exceed the values corresponding to the bandwidth as follows:

3.1.1. 4,5 mW ERP at bandwidth 115 ÷ 150 kHz and 13,553 ÷ 13,567 MHz.

3.1.2. 100mW ERP at bandwidths 29,7 ÷ 30,0 MHz; 146,35 ÷ 146,5 MHz; 240,15 ÷ 240,3 MHz; 300 ÷ 300,33 MHz; 312 ÷ 316 MHz; 444,4 ÷ 444,8 MHz.

3.2. Spurious emission:

3.2.1. At bandwidth 115 ÷ 150 kHz and 13,553 ÷ 13,567 MHz:

*Operating mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each 27 dB $\mu$ A/m descending 3dB/8 oct.

- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ : -3,5 dB $\mu$ A/m.

- Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ : 4nW.

- Other frequencies between 30 MHz and 1000 MHz: 250 nW

*Standby mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each 6 dB  $\mu$ A/m descending 3dB/8 oct.

- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ : -24,5 dB  $\mu$ A/m.

- Frequency  $30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$ : 2nW

3.2.2. At bandwidths 29,7 ÷ 30,0 MHz; 146,35 ÷ 146,5 MHz; 240,15 ÷ 240,3 MHz; 300 ÷ 300,33 MHz; 312 ÷ 316 MHz; 444,4 ÷ 444,8 MHz: the attenuation of spurious emission compared to the main emission not less than 40 dBc at the output of generator.



## APPENDIX 6

### TECHNICAL AND EXPLOITING CONDITIONS FOR RADIO ALARMS AND DETECTORS USED WITH CONDITIONS

#### 1. Definition

Wireless audio devices include radio waves applied devices to transmit audio or audio signals are modulated at short distances.

Some typical kinds of wireless audio devices: Lavalier wireless microphone, Hand wireless microphone, Wireless headphones, Personal FM radio, Hearing aid.

Wireless audio devices are used with conditions when operating in the specified frequency bands in paragraph 2 of this appendix; it should ensure the conditions in point 3 and point 4 of this appendix.

#### 2. Conditions on frequencies

2.1. Wireless audio devices are used with conditions at the following frequency bands:

2.1.1. 10,2 ÷ 11 MHz (only for hearing aids)

2.1.2. 40,66 ÷ 40,70 MHz

2.1.3. 80 ÷ 108 MHz

2.1.4. 182,025 ÷ 182,975 MHz

2.1.5. 217,025 ÷ 217,975 MHz

2.1.6. 218,025 ÷ 218,475 MHz

2.1.7. 470,075 ÷ 470,725 MHz

2.1.8. 482,19 ÷ 488,00 MHz

2.2. Channels distribution and frequency channel range:

2.2.1. Frequency band segment 482,19 ÷ 488,00 MHz is distributed with the following center frequencies:

2.2.1.1. 482,19 MHz

2.2.1.2. 483,24 MHz

2.2.1.3. 483,42 MHz

2.2.1.4. 487,00 MHz

2.2.1.5. 488,00 MHz

2.2.2. Frequency band segment 470,075 ÷ 470,725 MHz is distributed with the following center frequencies:

2.2.2.1. 470,075 MHz

2.2.2.2. 470,150 MHz

2.2.2.3. 470,375 MHz

2.2.2.4. 470,625 MHz

2.2.2.5. 470,725 MHz

2.2.3. At the other frequency bands in point 2.1 of this appendix: channel range should not be greater than 200 kHz and should be completely operated within the permitted frequency band mentioned at this point.

### **3. Conditions on emission**

3.1. The main emission: Capacity of the main emission is not greater than the values corresponding to the following frequency bands:

3.1.1. 4 µW EIRP at the frequency band 10,2 ÷ 11 MHz.

3.1.2. 100mW ERP at the frequency band 40,66 ÷ 40,70 MHz.

3.1.3. Frequency band 88 ÷ 108 MHz:

3.1.3.1. 20 nW EIRP for personal FM radio.

3.1.3.2. 3µW ERP for other devices in the kind of wireless audio devices used with conditions.

3.1.4. 10 mW ERP at the frequency band 470,075 ÷ 470,725 MHz.

3.1.5. 30 mW ERP at the rest frequency bands.

3.2. Spurious emission:

3.2.1. At the frequency band 88 ÷ 108 MHz: Attenuation of spurious emissions compared to the main emission is not less than 32dBc at the distance of 3m.

3.2.2. At the frequency band 10,2 ÷ 11 MHz:

#### *Operating mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each  $27 \text{ dB}\mu\text{A/m}$  descending  $3 \text{ dB}/8\text{oct}$ .
- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ :  $-3,5 \text{ dB } \mu\text{A/m}$ .
- Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ :  $4\text{nW}$ .
- Other frequencies between  $30 \text{ MHz}$  and  $1000 \text{ MHz}$ :  $250 \text{ nW}$

#### *Waiting mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each  $6 \text{ dB } \mu\text{A/m}$  descending  $3\text{dB}/8\text{oct}$ .
- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ :  $-24,5 \text{ dB } \mu\text{A/m}$ .
- Frequency  $30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$ :  $2\text{nW}$

3.2.3. At the frequency bands:  $40,66 \div 40,70 \text{ MHz}$ ;  $182,025 \div 182,975 \text{ MHz}$ ;  $217,025 \div 217,975 \text{ MHz}$ ;  $218,025 \div 218,475 \text{ MHz}$ ;  $470,075 \div 470,725 \text{ MHz}$ ;  $482,19 \div 488,00 \text{ MHz}$ : Attenuation of spurious emission compared with the main emission is not less than  $40 \text{ dBc}$  at the output of the generator.

#### **4. Other conditions**

Personal FM radio is only allowed to use the frequency band  $88 \div 108 \text{ MHz}$ .

## **APPENDIX 7**

### **TECHNICAL AND EXPLOITING CONDITIONS FOR RADIO FREQUENCY REMOTE CONTROL DEVICE USED WITH CONDITIONS**

#### **1. Definition**

Radio frequency remote control device includes radio waves applied devices to control models, control in industrial and household.

Some typical kinds of radio frequency remote control device: model control in the air as plane model , model control on the ground and water surface as car and ship model, control in industry and household as opening and closing control for car doors and garage.

Radio frequency remote control device is used with conditions when operating in the specified frequency bands in paragraph 2 of this appendix; it should ensure the conditions in point 3 of this appendix.

#### **2. Conditions on frequency**

Radio frequency remote control device is used with conditions at these following frequency bands:

2.1. 115 ÷ 150 kHz

2.2. 26,957 ÷ 27,283 MHz

2.3. 29,7 ÷ 30,0 MHz

2.4. 34,995 ÷ 35,225 MHz

2.5. 40,02 ÷ 40,98 MHz (only for plane model control)

2.6. 40,66 ÷ 40,70 MHz

2.7. 50,01 ÷ 50,99 MHz (only for plane model control)

2.8. 72,00 ÷ 72,99 MHz (only for plane model control)

2.9. 312 ÷ 316 MHz

2.10. 433,05 ÷ 434,79 MHz.

### 3. Conditions on emission

3.1. The main emission: Capacity of the main emission is not greater than these following values corresponding to frequency bands:

3.1.1. 4,5 mW ERP at the frequency band 115 ÷ 150 kHz.

3.1.2. 100mW ERP at the frequency band 26,957 ÷ 27,283 MHz; 29,7 ÷ 30,0 MHz; 34,995 ÷ 35,225 MHz; 40,02 ÷ 40,98 MHz; 40,66 ÷ 40,70 MHz; 40,77 ÷ 40,83 MHz; 50,01 ÷ 50,99 MHz; 312 ÷ 316 MHz.

3.1.3. 1 W ERP at the frequency band 72,00 ÷ 72,99 MHz (only for plane model ).

3.1.4. 10 mW ERP at the frequency band 433,05 ÷ 434,79 MHz.

3.2. Spurious emission:

3.2.1. At the frequency band 115 ÷ 150 kHz:

*Operating mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each 27 dB $\mu$ A/m descending 3 dB/8oct.

- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ : -3,5 dB  $\mu$ A/m.

- Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ : 4nW.

- Other frequencies between 30 MHz and 1000 MHz: 250 nW.

*Waiting mode:*

- Frequency  $9 \text{ kHz} \leq f \leq 10 \text{ MHz}$ : each 6 dB  $\mu\text{A/m}$  descending 3dB/8oct.

- Frequency  $10 \text{ MHz} \leq f \leq 30 \text{ MHz}$ : -24,5 dB  $\mu\text{A/m}$ .

- Frequency  $30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$ : 2nW

3.2.3. At the frequency bands 26,957 ÷ 27,283 MHz; 29,7 ÷ 30,0 MHz; 34,995 ÷ 35,225 MHz; 40,02 ÷ 40,98 MHz; 40,66 ÷ 40,70 MHz; 50,01 ÷ 50,99 MHz; 72,00 ÷ 72,99 MHz; 312 ÷ 316 MHz; 433,05 ÷ 434,79 MHz: Attenuation of spurious emission compared with the main emission is not less than 40 dBc at the output of the generator.

## APPENDIX 8

### TECHNICAL AND EXPLOITING CONDITIONS FOR WIRELESS LOCAL AREA NETWORK DEVICE USED WITH CONDITIONS

#### 1. 1. Definition

Wireless local area network device, herein called as “WLAN device”, is used to set up a wireless local area network instead of using cables.

Some typical kinds of WLAN device: access point (điểm truy nhập), wifi router (bộ định tuyến không dây), wifi card (bộ điều hợp mạng không dây).

WLAN device is used with conditions when operating in the specified frequency bands in paragraph 2 of this appendix; it should ensure the conditions in point 3 and 4 of this appendix.

#### 2. . Conditions on frequency

WLAN device is used with conditions at these following frequency bands:

2.1. 2400 ÷ 2483,5 MHz

2.2. 5150 ÷ 5250 MHz

2.3. 5250 ÷ 5350 MHz

2.4. 5470 ÷ 5725 MHz

2.5. 5725 ÷ 5850 MHz.

#### 3 Conditions on emission

3.1. The main emission: Capacity and power spectral density of the main emission is not greater than the values corresponding to the following frequency bands:

3.1.1. 100 mW EIRP trong băng tần 2400 ÷ 2483,5 MHz và 100 mW/100KHz EIRP đối với thiết bị sử dụng điều chế FHSS hoặc 10 mW/1 MHz EIRP đối với thiết bị sử dụng điều chế khác.

3.1.2. 200 mW EIRP và 10 mW/MHz at the frequency band 5150 ÷ 5250 MHz

3.1.3. 200 mW EIRP và 10 mW/MHz at the frequency band 5250 ÷ 5350 MHz

3.1.4. 1 W EIRP và 50 mW/MHz at any MHz at the frequency band 5470 ÷ 5725 MHz and the frequency band 5725 ÷ 5850 MHz.

3.2. Spurious emission: when operating, WLAN device at the above frequency band should comply with limits of spurious emission in this appendix:

3.2.1.1. Narrow-frequency band spurious emissions:

*Operating mode:* The capacity of spurious emissions does not exceed these following values:

- Frequency bands  $30 \text{ MHz} \leq f \leq 1 \text{ GHz}$ : -36 dBm
- Frequency bands  $1,8 \text{ MHz} \leq f \leq 1,9 \text{ GHz}$ ;  $5,15 \text{ GHz} \leq f \leq 5,3 \text{ GHz}$ : -47 dBm
- Other frequency bands within  $1 \text{ GHz} \leq f \leq 12,75 \text{ GHz}$ : -30 dBm

*Waiting mode:* The capacity of spurious emissions does not exceed these following values:

- Frequency bands  $30 \text{ MHz} \leq f \leq 1 \text{ GHz}$ : -57 dBm
- Frequency bands  $1 \text{ MHz} \leq f \leq 12,75 \text{ GHz}$ : -47 dBm

3.2.1.2. Broad-frequency band spurious emissions:

*Operating mode:* The capacity of spurious emissions does not exceed these following values:

- Frequency bands  $30 \text{ MHz} \leq f \leq 1 \text{ GHz}$ : -86 dBm/Hz.
- Frequency bands  $1,8 \text{ MHz} \leq f \leq 1,9 \text{ GHz}$ ;  $5,15 \text{ GHz} \leq f \leq 5,3 \text{ GHz}$ : -97 dBm/Hz.
- Other frequency bands within  $1 \text{ GHz} \leq f \leq 12,75 \text{ GHz}$ : -80 dBm/Hz

*Waiting mode:* The capacity of spurious emissions does not exceed these following values:

- Frequency bands  $30 \text{ MHz} \leq f \leq 1 \text{ GHz}$ : -107 dBm/Hz.
- Frequency bands  $1 \text{ GHz} \leq f \leq 12,75 \text{ GHz}$ : -97 dBm/Hz.

3.2.2. At the frequency bands 5150 ÷ 5250 MHz, 5250 ÷ 5350 MHz; 5470 ÷ 5725 MHz; 5725 ÷ 5850 MHz:

- Frequency band  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ : -54 dBm ERP (with 100 kHz bandwidth).

- Other frequency bands between 30 MHz and 1000 MHz: -36 dBm ERP (with of 100 kHz bandwidth).

- Frequency  $1 \text{ GHz} \leq f \leq 26,5 \text{ GHz}$ : -30 dBm ERP (with 1 MHz bandwidth)

#### **4. Other conditions**

4.1. WLAN devices are only used on the ground.

4.2. WLAN devices operating within the frequency band 5150 ÷ 5250 MHz are only used indoor (Indoor use).

4.3. The frequency radio access systems operating within the frequency band 5250 ÷ 5350 MHz; 5470 ÷ 5725 MHz should have ability in:

- Dynamic Frequency Selection (DFS)

- Transmitter Power Control (TPC). This condition is not required to apply in the frequency radio access systems operating within the frequency band 5470 ÷ 5725 MHz with capacity of less than 500 mW EIRP.

4.4. WLAN devices used for the purpose of providing services must comply with regulations on service providers by the Ministry of Information and Communications.

## **APPENDIX 9**

### **TECHNICAL AND EXPLOITING CONDITIONS FOR FREQUENCY RADIO FREQUENCY TELEMETRY DEVICE USED WITH CONDITIONS**

#### **1. Definition**

Frequency radio telemetry device automatically display or record measurement parameters and control the functions of other devices via frequency radio interface.

Frequency radio telemetry device is used with conditions when operating in the specified frequency bands in paragraph 2 of this appendix; it should ensure the conditions in point 3 of this appendix.

#### **2. Conditions on frequency**

Frequency radio telemetry device is used with conditions at these following frequency bands:

2.1. 26,957 ÷ 27,283 MHz

2.2. 29,70 ÷ 30,00 MHz

2.3. 40,50 ÷ 41,00 MHz (only for medical and biological applications)

2.4. 216 ÷ 217 MHz (only for medical and biological applications)

2.5. 433,05 ÷ 434,79 MHz

### **3. Conditions on emission**

3.1. The main emission: Capacity of the main emission is not greater than the values corresponding to the following frequency bands:

3.1.1. 100 mW ERP at the frequency band 26,957 ÷ 27,283 MHz; 29,7 ÷ 30,0 MHz.

3.1.2. 0,01mW ERP at the frequency band 40,5 ÷ 41,0 MHz; 216 ÷ 217 MHz.

3.1.3. 10 mW ERP at the frequency band 433,05 ÷ 434,79 MHz.

3.2. Spurious emission:

3.2.1. At the frequency band 26,957 ÷ 27,283 MHz; 29,7 ÷ 30,0 MHz; 216 ÷ 217 MHz; 433,05 ÷ 434,79 MHz: Attenuation of spurious emissions compared to the main emission is not less than 40 dBc at the output of generator.

3.2.2 At the frequency band 40,50 ÷ 41,00 MHz: Attenuation of spurious emissions compared to the main emission is not less than 32dBc at the distance of 3m.

## **APPENDIX 10**

### **TECHNICAL AND EXPLOITING CONDITIONS FOR WIRELESS VIDEO TRANSMITTER USED WITH CONDITIONS**

#### **1. Defintion**

Wireless video transmitter is used to transmit image data to processing system via the radio interface.

Some typical kinds of wireless video transmitter: wireless webcam, wireless camera, wireless video transmitter via USB interface from PC.

Wireless video transmitter is used with conditions when operating in the specified frequency bands in paragraph 2 of this appendix; it should ensure the conditions in point 3 of this appendix.

#### **2. Conditions on frequency**



Wireless video transmitter is used with conditions at these following frequency bands:

2.1. 2400 ÷ 2483,5 MHz.

2.2. 10,50 ÷ 10,55 GHz

2.3. 24,00 ÷ 24,25 GHz.

### 3. Conditions on emission

3.1. The main emission: Capacity of the main emission is not greater than the values corresponding to the following frequency bands:

3.1.1. 10 mW EIRP in the frequency band 2400 ÷ 2483,5 MHz;

3.1.2. 100 mW EIRP in the frequency band 24,00 ÷ 24,25 GHz; 10,50 ÷ 10,55 GHz.

3.2. Spurious emission:

3.2.1. At the frequency band 2400 ÷ 2483,5 MHz; 10,50 ÷ 10,55 GHz and 24,00 ÷ 24,25 GHz

- Frequency  $47 \text{ MHz} \leq f \leq 74 \text{ MHz}$ ;  $87,5 \text{ MHz} \leq f \leq 118 \text{ MHz}$ ;  $174 \text{ MHz} \leq f \leq 230 \text{ MHz}$ ;  $470 \text{ MHz} \leq f \leq 862 \text{ MHz}$ :

+ *Operating mode*: Capacity of spurious emission does not exceed: 4 nW

+ *Waiting mode*: Capacity of spurious emission does not exceed: 2 nW

- Frequencies smaller than 1000 MHz:

+ *Operating mode*: Capacity of spurious emission does not exceed: 250 nW

+ *Waiting mode*: Capacity of spurious emission does not exceed: 2 nW

- Frequencies greater than 1000 MHz:

+ *Operating mode*: Capacity of spurious emission does not exceed: 1  $\mu$ W

**3.10 NATIONAL STANDARD TCVN 5729/20\*\*:  
STANDARD FOR DESIGN EXPRESSWAY**

**TCVN 5729: 20\*\***

**EXPRESSWAY STANDARD FOR  
DESIGN**

**HANOI - 2007**

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## Applications

This specification is applied for designing new freeway/expressway outside the urban areas (abbreviated as expressway).

In some special cases, some other standards can be applied but it must be technically and economically analyzed and approved by the Authorities.

## Standards and reference documents

Regulations for traffic road, No 26/2001/QH10;

Decree 186/NĐ-CP dated November 05 2004 regarding the Regulations in management and protection of road transport infrastructure.

- TCVN4054 Highway - Design Specification
- TCXDVN 104 Urban Road - Design Specification;
- TCVN 2737 :1990 Loading Capacity and Effect - Design Standards;
- TCVN 4527 :1988 Tunnel for Railway and Road - Design Standards;
- 22 TCN 272 Bridge Design Standards;
- 22 TCN 221 Transportation Structure in Earthquake Area - Design Standards;
- 22 TCN 211 Flexible Pavement - Technical Specification for Design;
- 22 TCN 223 Procedure for Rigid Pavement Design;
- 22 TCN 237 Road Signal Regulation;
- 22 TCN 278 Pilot Procedure for Determining Roughness Index by Sand spreading method;
- 22 TCN 345 Thin Asphalt Concrete with High Roughness Index – Technical procedure for construction and commissioning;
- 22 TCN 277 Standard for Inspecting and Appraising Road Surface based on International Roughness Index (IRI);
- 22 TCN 242 Procedure of assessing Environment impact during Feasible Study and Design Stage;
- 22 TCN 262 Procedure of Survey and Design fill road pavement on Soft Soil Area;
- 22 TCN 171 Procedure of Geology Survey and Method of pavement stabilization in the area of sliding, erosion.

Note: For the reference documents showing published year, apply that edition. In the case published year is not shown, apply the currently effected version.

## General regulations

### Definition:

The term “expressway” in this standard should be understood as follows:

The expressway is specially used by cars with the following specifications: separating two directions (each direction requires a minimum of two lanes; each direction needs the emergency lane). There should be no level crossing with other traffic flows. The expressway shall have appropriate equipment and service to ensure smooth and comfortable traffic flow. The expressway only allows car to enter and exit at the regulated locations (besides these entry/exit locations, the expressway is fully separated from the residential areas and other means of transport).

Regarding its function, the expressway is the mean of transport that has high flexibility with the priority to shorten the travel time and ensure traffic safety for cars (predominantly to provide high efficiency for long-distance car travelling).

### **Expressway grades**

Expressway is divided into 4 grades:

- Grade 60 with the design speed of 60 km/h
- Grade 80 with the design speed of 80 km/h
- Grade 100 with the design speed of 100 km/h
- Grade 120 with the design speed of 120 km/h

Grade 60, 80 are applied for the difficult topography such as mountainous, rolling terrain and areas with other restrictions, the grades 100,120 are for flat topography.

In the case of improving the old road into expressway, the regulations in this specification must be complied although it is encouraged to maximize the utilization of existing works.

Note: If the quality of the old road is too bad, highly populated residential developments on both sides, the expressway should be newly designed (separately from the old route).

Expressway should be cooperated well with the urban planning and suitable with the economical centers in the future. During design, it is necessary to provide the measures to ensure the transport connection between the urban areas and expressway (including the measure of gathering traffic in the entry/exit points located on the expressway). Besides, on the basis of comprehensive investigation and evaluation of the environmental impact, it is necessary to mention the solutions to protect natural and social environment, to prevent the impact resident liveliness along the expressway, to pay particular attention to the solutions to ensure the normal transportation for the residential areas, which are separated by the expressway.

In the preparation stage of the expressway construction project (basic design stage), it is necessary to undertake studies to clarify the following contents:

Study to confirm the necessity of expressway construction, to define the control points for establishing alignment options, to compare and select the options and to evaluate the economic and financial effectiveness of the selected route.

Study to confirm the number of lanes (if more than two lanes for each direction are required) based on the evaluation of traffic capacity, study to confirm the necessity and effectiveness of constructing the uphill lane for slow cars (see item 5).

Study to confirm the necessity of arranging the traffic lanes for each direction at different elevation to reduce the quantity of expressway pavement earthworks (if the expressway runs along the mountain/hill slopes or it is possible to rehabilitate the existing two-lane road to form part of the new expressway).

Study to confirm the entry/exit locations on the expressway, study to select and compare the types and arrangement options of intersections on the expressway.

Study the options of longitudinal sections to be above or under the residential road crossing, especially the sections in soft ground areas.

Compare the options and study to confirm location of toll stations.

Expressway shall be designed based on the traffic volume forecast for 20 years from the commissioning year and the planning of railway, waterway, road, aerial, pipelines network at present and in the future so that the designed expressway can maximize its efficiency in the overall network. Besides, there should be no negative impacts to the activities of other short-distance and local transportation. It is also necessary to be aware of reserve land for the widening of traffic lane, intersection areas in the far future.

Although having to consider for the far future, since the expressway construction investment scope is large, the stage investment options must be considered in preparation of freeway/expressway project.

In the case of considering the stage investments, it is necessary to prepare a comprehensive general design for the future to ensure the inheritance of previously constructed works in the previous stages, also to ensure the staged design can provide advantageous condition to the construction works in the next stages.

It is necessary to pay attention to the space coordination of alignment elements to ensure safe, comfortable, steady, continuous feeling, clearly clarify the alignment visually and psycho-physiologically to users, and to ensure the well combination between the expressway and the scenery, the environment along the route by arranging the trees or equipment, structures on both sides of the road, also to supplement or minimize the cause of damaging natural landscaping due to the expressway construction.

To verify and evaluate the combination options, it is essential to prepare perspective presentation or 3D model of the sections with the above requirements during the design.

Design of freeway/expressway at earthquake area which is forecasted level 7 or above (following MSK64 scale) must be obeyed standard 22 TCN 221.

Basis for expressway design

The vehicles use on expressways are cars which are allowed to run on public road network and motorbikes which has appropriate power regulated by the Authorities (recommended to be over 175cm<sup>3</sup>). The size of cars on expressway is the size regulated in TCVN 4054 Highway - Design standards and it is the

basis to determine the technical standards for geometrical elements and navigation clearance limit on the expressway.

Besides the above-mentioned cars and motorbikes with appropriate power, the people and other vehicles, that wish to use the expressway, should obtain permits from the Authorities.

### Traffic regulations on freeway/expressway

The vehicles must run on the correct lane; overtaking is only allowed in the left lane; if there is auxiliary lane, it must be used by slow and heavy vehicles; if the car exits from expressway, it must run on the auxiliary/split lane and reduce speed; if it enters the expressway, it must run on the accelerating lane, waiting for merging into the expressway.

The vehicles are allowed to stop on the expressway (except for the emergency case, it can stop on the emergency lane)

The vehicles are only allowed to turn its direction (U-turn) at the next intersection or at the regulated locations in item 7.4.3 (the break between medians are for reservation only)

In geometric design, guiding and warning elements must follow and ensure the compliance with the above regulations.

Normally, the construction of expressway should be considered if the forecasted traffic volume is approximately 25,000 units /day. It must not be understood that we have enough basis to make decision for the expressway construction investment project if the traffic volume is over the mentioned number. This figure is for guidance only. In any expressway construction project (irrespective of how large the traffic volume is), it is necessary to prepare economical and financial evaluation report with the consideration of political, national defense, cultural and social requirements and international relation and exchange to make decision on the expressway construction.

The calculated traffic volume is understood as the average daily traffic volume per year of the vehicles which are allowed to run on the expressway. The volume is converted to equivalent car in the calculated year correlative with the calculate time as mentioned in 3.8. The converted ratio into car is applied according to TCVN 4054.

In the expressway, there may be some sections with various grades, but these sections must be at least 15km long and the design speeds variation at two continuous sections cannot be more than 20km/h. If there is over one grade (20km/h) difference, it is necessary to have one transition section with the minimum length of 2km according to the standard of the road grade of the transition section.

Define the required number of lane for the expressway.

The required number of lanes for each direction of the expressway is determined based on the estimated traffic volume of each direction  $N_k$  at the  $k^{\text{th}}$  hour of the evaluated year (car/hour) and the design traffic capacity  $N_{tk}$  of each lane (car/hour.lane) as follows



$$N_{lx} = \frac{N_k}{N_{tk}}$$

$N_k$  and  $N_{tk}$  are calculated in PCUs. The required number of lanes for each direction of the expressway shall be an integer, not less than two.

Determine the value of  $N_k$

The meaning of  $N_k$ : in the calculated year (refer 3.8), there are only  $k$  hours with similar or larger traffic volume than  $N_k$ ;  $k$  is stipulated as 30 hours or 50 hours (usually the 30th peak hour of the year).

If there is no basis for estimating  $N_k$ , the designer is allowed to apply the following correlation to define  $N_k$ :

$$N_k = K \cdot N_{avg \text{ year}}$$

of which:

$$K = 0.13 \div 0.15$$

$N_{tbnam}$  is the average daily traffic volume per year for each direction in the calculated year (car/day).

For each direction of expressway, there may be different  $N_{tbnam}$

#### 4.5.3 Determine the value of $N_{tk}$

Design traffic capacity of one lane  $N_{tk}$  is defined as follow:

$$N_{tk} = Z \cdot N_{tmax}$$

of which:

$N_{tmax}$  is the largest actual traffic capacity of one lane in the standard condition (travel in straight and flat section) (PCU/hour-lane); as for expressway, apply  $N_{tmax} = 2,000$  PCU/hour.lane.

$Z$  is the level of service coefficient, defined as follows:

For expressway in flat and hilly terrain, apply  $Z = 0.55$ ; for mountainous area, apply  $Z = 0.77$ .

Navigation clearance on expressway is showed in figure 1.

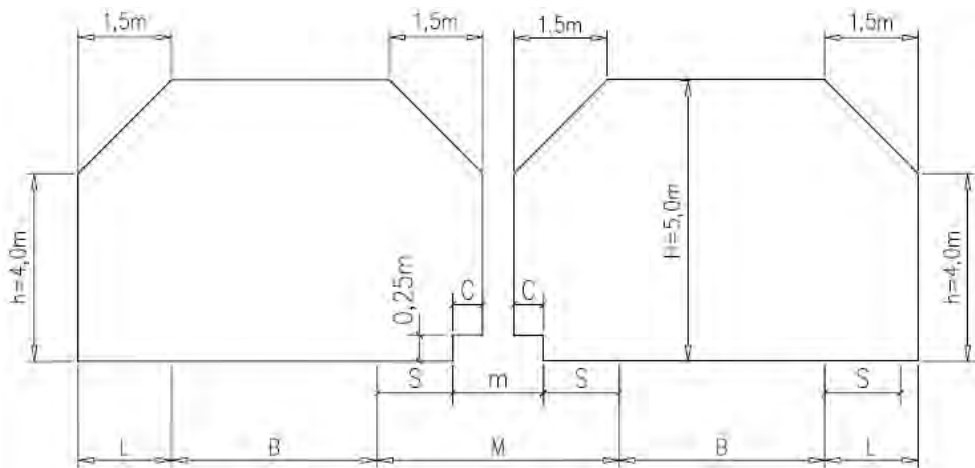


Figure 1 – Navigation clearance on expressway

of which:

$m$  - the width of separating strip

$M$  - the width of median strip

$S$  - the width of the emergency strip

B - the width of the carriageway (road surface), measured in meter.

L - the width of hard shoulder (excluding the grass shoulder)

The values m, M, S, B, L are determined in accordance with regulations in 5.1 depending on the grade of expressway and the structure of separating strip.

The coefficient c is stipulated as 0.3m for grade 120; 0.25m for grades 100, 80 and 60.

H = 5.00m is the height of navigation clearance, measured from the highest point on the carriageway B (H should be increased by 0.1-0.2m to allow for raising of road pavement level in the tunnel under repair).

h = 4.0m is the height, measured from the edge of hard shoulder.

The navigation clearance of the expressway tunnel is specified in Figure 1 with the following notes:

For the tunnel less than 1000m long, since there is no need for emergency lane, the width of hard shoulder L in Figure 1 can be reduced to 1.50m for grade 60 and 80 expressways and 1.25m for grade 100 and 120 expressway to ensure the arrangement of 1.0m wide footpath with sufficient clearance from carriageway edge for the pedestrians. For this scope of L, the coefficient h is defined as follows:

$$h = \Delta h + 2.5$$

of which

$\Delta h$  is the difference between the height of footpath pavement and safety lane surface S (normally,  $\Delta h = 0.40\text{m}$ )

2.5 is the navigation clearance for pedestrians, measured in meter.

For the expressway tunnel longer than 1000m, at the widened area for the emergency lane regulated in 5.13.1, the navigation clearance is maintained as Figure 1, depending on the expressway grade.

### Navigation clearance required underneath the expressway

When the expressway flies over the railways, roads, waterways with ship navigation..., it is necessary to ensure that the navigation clearance under the expressway shall be correlative with the standard, specification of railway, road, waterway to ensure the comfortable transport on those routes. If the residential road under the expressway is for pedestrians, bicycles and non-motorised vehicles only, the clearance height at this location is specified as 2.50m with the minimum width of 4.0m.

### Cross section arrangement of expressway

The elements of expressway cross section are shown in Figure 2.

The standard width of the elements on the cross-sectional for each direction of two-lanes expressway is stipulated in Table 1.

The crossfall of the road surface on the straight section shall be 2% slope to the outer-edge. For the curve section, it requires the crossfall  $i_{sc}\%$  as stipulated in Figure 3, where the safety lane on the shoulder of the curve must be designed with the crossfall of 2% towards the outer-edge.

The safety lane shall be arranged to allow vehicles to run at the high speed. Besides, the safety lane next to the road outer-edge is also used for emergency vehicles if necessary (also called the emergency stopping lane).

In area of 0.25m adjacent to the edge of carriageway, the safety lanes on either side must have the same road pavement structure (assume widening 0.25m to both sides). Beyond this area, the remaining portion of the safety lane can have thinner pavement structure, but for the safety land on the shoulder (the reinforced shoulder side), it must ensure the durability for emergency stopping vehicles (not very often). The structure and design of safety lane must follow the guidance in 22 TCN 211.

In the area of the 0.25m widening referred above, use the paint of regulated color to draw a 0.2m wide direction-guiding line adjacent to the edge of road surface. This line must be visible at night (using road marking reflection painting).

The crossfall of the safety lane located in the median area must be the same as the crossfall of road pavement for both straight and curve sections as referred in 5.2 (Figures 2 & 3).

On straight sections, the crossfall of the safety lane in the area of hard shoulder is 4% (Figure 2). On curve alignment which  $i_{sc}$ , the crossfall shall be the same with  $i_{sc}$  of the emergency stopping lane at the inner side of the curve, for the outer side of the curve, the crossfall is towards outside with the gradient of 2% (Figure 3).

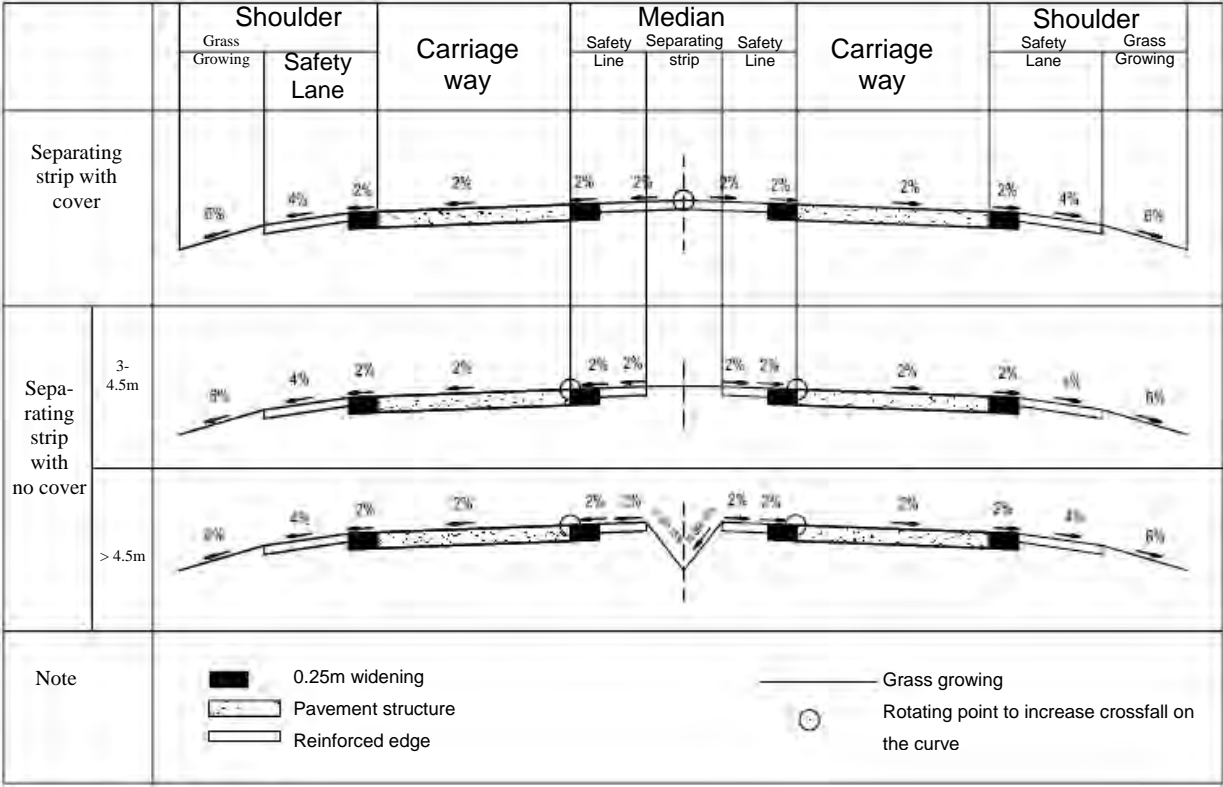


Figure 2 – Elements on expressway cross Section

The grass-growing shoulder must be graded away from the carriageway with the cross fall of 6% (see Figures 2 & 3).

The median includes two safety lanes on both sides and one separating strip (Table 1) to divide two traffic directions, to reserve spaces for support of flyover structure, signal pedestal, protective equipment, trees, anti-glaring devices (due to headlight of opposite vehicles) and putting line, pipeline or drainage system. The width of separating line can be bigger than stipulation in Table I so that there is sufficient land for the mentioned works or widening the road in future if necessary.

unit: meter

Structure of separating strip	Express-way grades	Shoulder		Carriage-way	Median			Carriage-way	Shoulder		Road width
		Grass-growing	Safety lane (reinforced shoulder)		Safety lane	Separating strip	Safety lane		Safety lane	Grass-growing	
1. with cover without column	60	0.75	2.5	7.0	0.50	0.5	0.50	7.0	2.5	0.75	22.0
	80	0.75	2.5	7.5	0.50	0.5	0.50	7.5	2.5	0.75	23.0
	100	0.75	3.0	7.5	0.75	0.5	0.75	7.5	3.0	0.75	24.5
	120	1.00	3.0	7.5	0.75	1.0	0.75	7.5	3.0	1.00	25.5
2. with cover and column	60	0.75	2.5	7.0	0.50	1.5	0.50	7.0	2.5	0.75	23.0
	80	0.75	2.5	7.5	0.50	1.5	0.50	7.5	2.5	0.75	24.0
	100	0.75	3.0	7.5	0.75	1.5	0.75	7.5	3.0	0.75	25.5
	120	1.00	3.0	7.5	0.75	1.5	0.75	7.5	3.0	1.00	26.0
3. without cover	60	0.75	2.5	7.0	0.50	3.0	0.50	7.0	2.5	0.75	24.5
	80	0.75	2.5	7.5	0.50	3.0	0.50	7.5	2.5	0.75	25.5
	100	0.75	3.0	7.5	0.75	3.0	0.75	7.5	3.0	0.75	27.0
	120	1.00	3.0	7.5	0.75	3.0	0.75	7.5	3.0	1.00	27.5

Table 1-The standard width of cross section elements on expressway

Note:

1) The columns in the table are arranged correlative with the elements on cross section from left to right in case two traffic directions are on the same road pavement. In difficult topographic area, each traffic direction can be arranged on separate pavement, the road width will then consist of the width of one-direction carriageway plus two shoulder widths (for the right shoulder, the width is the same as in Table 1, for the left shoulder, the safety lane (reinforced shoulder) is decreased to 1.00 for road grades 120 and 100, and 0.75 for the grades 80 and 60.

2) If each direction has 3 lanes, the pavement width should have additional 3.50m (grade 60) or 3.75 (grade 80, 100, 120) and the width of freeway/expressway base must be plus 7.0m (grade 60) or 7.5m (grade 80, 100, 120).

3) In any case the width of separating line is considered as the minimum.

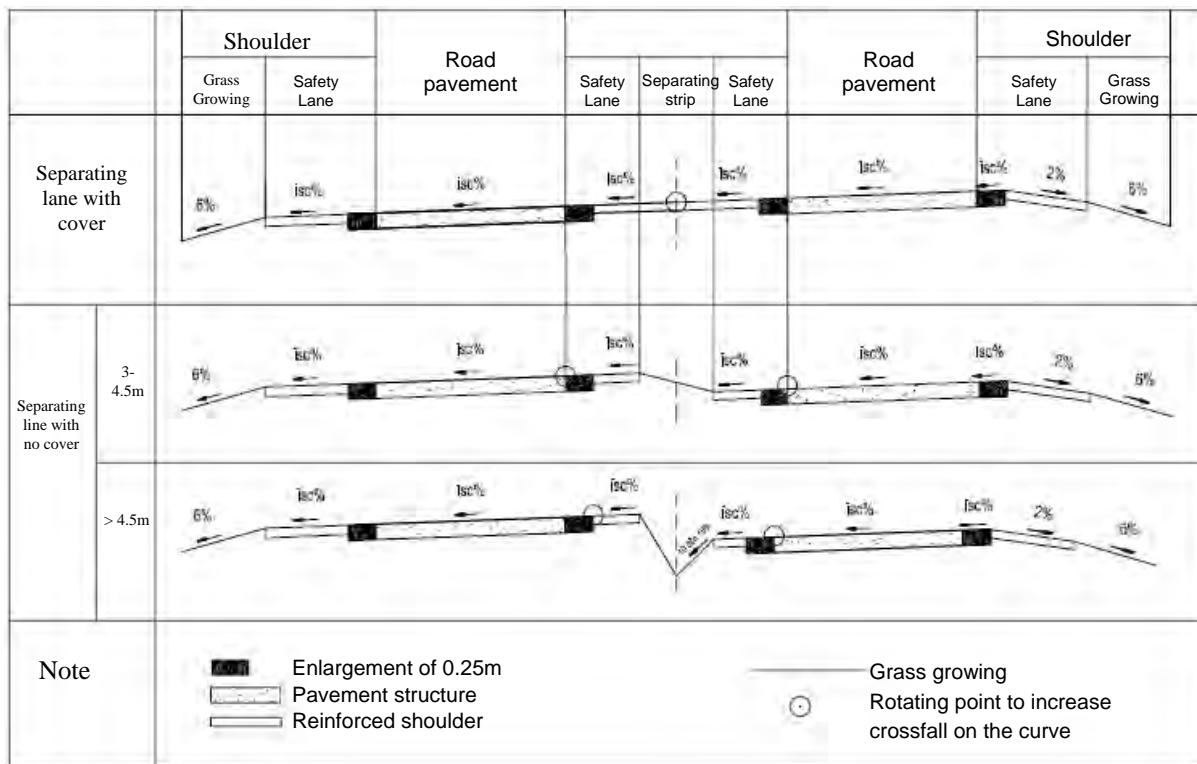


Figure 3 - Freeway/expressway Cross Section

If the width of the median is less than 3.0m there shall be a surfacing layer and the crossfall of this layer from its centerline must be equal to the crossfall of the road pavement in item 5.2 ( see Figure 2). For the median with curb and 1.5m - 3.0m width, the surfacing layer is not required but it requires the solution to prevent dirt and unclean water from the median flowing to road pavement (the land in the median between two curbs must be lower than the top of curb) and to preventing surface water infiltrated from the median to the expressway pavement (install waterproofing layer of well compacted clay underneath).

If the width of the median is between 3.0m and 4.5m, there is no need for cover layer; grass planting is required with the cross fall of 0% for the straight section (Figure 2). For the curve section, we can connect the outside of one safety lane to the inside of the other safety lane after two parts of road pavement of two directions are super-elevated separately (Figure 3).

In this case, no matter if the median is curbed or not, there must be longitudinal drainage system along the median (install open trench, trench with grated cover, underground drainage pipe, infiltration trench etc.)

If the width of the median is more than 4.50m, its cross section must be designed into V shape with the crossfall from the two safety lanes on both sides to centerline between 10% and 15% (see figure 2 & 3). There should be some measures to guide the direction at night or in bad weather condition (to clearly identify the carriageway edge and the safety lane) to prevent vehicles from running into the median.

Along the median, at every 2 - 4km interval, in front of major structures (bridge, tunnel), a median break of 25-30m long is required to allow vehicles to turn its direction if necessary (the management and barrier are

arranged here, it is only open for U-turn in urgent case). The location of median break sections must be selected on the straight section or curve sections if the curve section is well ventilated and visible with a minimum radius of 600m.

The end of the median strip at the break shall be filleted with semi-circle.

In the design case with the median strip with curb, the curb must be at least 15cm higher than the road surface, the face of curb shall be sloped towards the carriageway (vertical face shall be avoided) and the top face of kerb must be filleted.

In this case, there must be drainage measures to drain water along the curb channel in on the curve sections with super-elevation towards one end (drainage pipe or underground trench with grated inlet).

In difficult topography or for purpose of reducing the size of flyover or road crossing structures on the expressway, the width of the cross section elements in Table 1 can be reduced as follows if approved by the investment Authorities:

- The width of expressway pavement is reduced to 7.0m. The width of the median strip cannot be reduced.
- The width of the safety lane must not be reduced below 0.5m. The width of the emergency lane must not be less than 2.0m or the emergency lane is arranged with 30m length for every 500m interval.
- The grass-growing shoulder must not be less than 0.75. For the Grade 60 expressway, it must not be less than 0.5m.

The length of the narrowed sections in the cross sections as mentioned above must not be between 0.5km - 1km or more than 2km. The transitional section from the standard section to narrowed section must be 1° slope maximum compared with the centerline. The ends of the transitional section are connected with the curve sections with the radius larger than the correlative radius with the grade of  $i_{sc} = + 2\%$  (Table 4).

If the traffic directions are on separate pavements, the standard cross section of the expressway is stipulated in item 1 of the Notes of Table 1.

If each direction has more than two lanes, the arrangement of the cross section shall still comply with the regulations for shoulder and median of Table 1. For the width of road pavement, it is necessary to add 3.50m for each additional lane (Grade 60 and 80) and 3.75m for each additional lane (Grade 100 and 120) (refer note 2 of table 1).

### Up-hill auxiliary lane

Consideration shall be given to the construction of uphill auxiliary lane on 4-lane expressway in the following cases:

- The section with the longitudinal gradient of 3% or more and the length of the slope of 800m or more for the expressway of grade 100 and 120.
- The slope section with the vehicle speed of truck is below the permissible value in table 2, and the calculated traffic volume on the upside direction (2 lanes) exceeds the design traffic capacity in item 4.5.3 ( $N_{tmax}$  is determined correlative with the specific gradient of the design

slope section; in preliminary calculation, the value  $N_{tmax}$  of the uphill section is average of 1600 units /hour/lane).

Measured by km/h

The grade of expressway	120	100	80	60
The minimum acceptable speed for vehicles going up the slope	60	55	50	40

Table 2 - The minimum permissible speed for vehicles going up the slope on freeway/expressway

- In the slope section which the uphill speed of truck is less than the permissible value in table 2 and the length of the slope is more than 1000m, the speed of uphill truck must be evaluated based on the type of vehicle, the grade and the length of the slope

- No consideration is given to the construction of uphill auxiliary lane for the 6-lane expressway (each direction has 3 lanes or more) and the 4-lane expressway with high bridge, tunnel, and pavement with deep cut.

Note: In the cases with above conditions, the decision whether to construct auxiliary lane for uphill truck shall depend on specific economic and financial study for each particular case. The study must calculate the time savings when light vehicles are going up the slope, when another lane is dedicated for the trucks.

Structure and arrangement of auxiliary lane of going up slope

- The width of auxiliary lane for uphill slope must be 3.50m; it can be reduced to 3.25m for the difficult mountainous and hilly topography.

- The auxiliary lane shall be located next to the outer lane of the carriageway with the lane separating line of 0.20m width (this line is in the area of the auxiliary lane).

- The transitional section with triangular style from the outer main lane to auxiliary lane is minimum 45m long and located in front of the point of changing longitudinal grade; the outer side of transition section must be connected with the curve line.

- At the end of slope, the transition section must be provided so that the trucks accelerate to merge into the main lane; the length of this section from top of the slope (the grade changing location on the convex curve in the longitudinal section) is stipulated in table 3.

Longitudinal slope after going up the slope, %	Down-hill	Flat (0%)	Uphill			
			0.5	1.0	1.5	2.0
The length of the transition section after the slope, m	150	200	250	300	350	400

Table 3 - The length of transition section following the slope of auxiliary lane for vehicles going uphill

There must be connection of triangular style of 75m at the end of transitory section.

Cross section of expressway at the section with uphill auxiliary lane.

- At the slope section with the auxiliary lane without the emergency lane, the outside of the auxiliary lane only needs the safety lane of 0.50m (with lane separation line marking of 0.20m), followed by the grass shoulder of 0.75m.
- On the straight expressway section, the crossfalls of auxiliary lane, of the safety lane and of the shoulder are the same as the crossfall of the section without auxiliary lane.
- When the expressway is on the curve, the super-elevation in the area of auxiliary lane is maximum 4% (correlative with the super-elevation specified for the main lanes from 4% to 8%); if the super-elevation of the main lane is less than 4%, the super-elevation of auxiliary lane shall be the same as main lane's.

### The cross section of freeway/ expressway at the section of parallel speed-changing lane

- The width of speed-changing lane is 3.50m for one lane and 7.00m for two lanes. This lane is separated from the main lane by a pavement marking of 0.20m width (this marking is in the area of speed-changing lane).
- The speed-changing lane should be located on the cross section of expressway similarly to uphill auxiliary lane in item 5.9.3; for the curve the super-elevation in the area of speed-changing lane should be linearly changed according the increase or decrease of speed in the scale of super-high gradient of main traffic and the one of the out/in-coming section to freeway/expressway.

### Protective corridor for expressway

Protective corridor for expressway begins from the outer edge of the table drain on both sides of the fill embankment (from the batter toe or toe of the supporting structure if there is no table drain), or from the outer edge of the gutter on top of cut batter (if there is no top gutter, then calculate from the top of batter) to the outside according to the Regulations on Road Management issued with the Decree 186/2004/ND-CP.

For the section of high embankment or deep excavation, embankment on soft ground, the determination of protective corridor must be based on the protection works such as counter berm, retaining wall etc.

It is necessary to rely on the practical requirement and detailed design to define the land corridor for the arrangement of equipment along the alignment, rest areas, service areas and toll stations on expressway on the principle of saving land and using uncultivated land.

In the area of land corridor stipulated in item 5.11.1, plants are only allowed to grow according to the current regulation, the non-road works such as channel excavation, burying of pipeline, cable and electricity pole and other equipment are not allowed to be constructed. For BOT expressway projects, the use of this corridor is regulated in the permit documents and investment agreements.

### The cross section of the bridge on expressway

5.12.1 The bridge cross section is arranged and applied the standards of the road cross section of the correlative grade in item 5.1 (fully including the shoulder, pavement, median with the dimension stipulated in table 1). The grass shoulder is replaced by the auxiliary strip for operation service and parapet wall as shown in figure 4. It means that the width of the bridge (from the outside edge of this bridge parapet to the outside face of the other one) is equal to the width of road pavement at the correlative grade.



5.12.2 In difficult cases, the cross section of bridges with more than 100m length can be narrowed as shown item 5.6 (including the stipulation of arrangement of the transitional section from the standard cross-section to narrowed cross section) if it was approved by the investor.

For the bridge with 100m length or less, the cross section cannot be narrowed (the length includes two abutment lengths).

5.12.3 The cross section on Expressway Bridge shall be kept unchanged along to the length of bridge, including the length of two abutments. The structure of cross fall direction and crossfall grade of bridge on the straight or curve section are the same as the road (item 5.2).

5.12.4 On the cross section, the bridge on the expressway is often divided into two separate bridges for two traffic directions (figure 4), therefore there may be a gap with the same width the median taking into account the two parapets. This gap can be used for lightening the underpass below the expressway or covered by light material which is able to resist pedestrian loading if narrow (for repair and maintenance purpose).

5.12.5 For the bridge on expressway, arrange each traffic direction on separate pavement. For the section with auxiliary lane (uphill or speed-changing), the cross section shall be arranged so that the width (between outside edges of two parapets as shown in figure 4) shall be equal to the width of road pavement as stipulated for cases in items 5.7, 5.8, 5.9.3, 5.10.

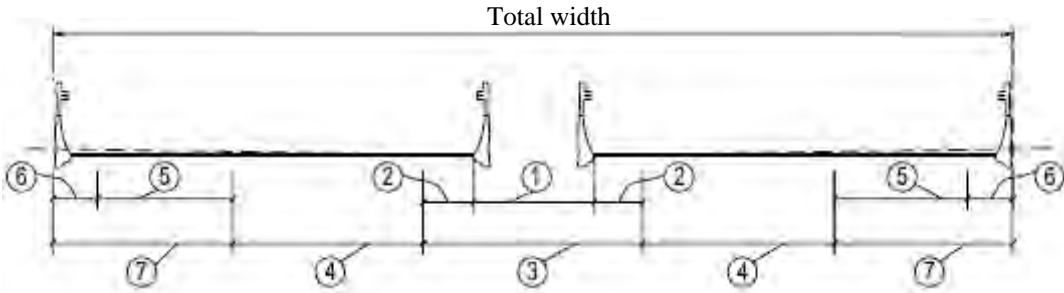


Figure 4-The cross section of bridge on freeway/expressway

Note:

- 1) The same as the width of separating strip,
- 2) The same as the width of safety lane inside.
- 3) The same as the width of the median
- 4) Expressway pavement surface (carriageway)
- 5) The same as the width of safe line on the right
- 6) The grass shoulder is replaced by the area of parapet and walkway for expressway operation staff.
- 7) Correlative with the width of the right pavement.

The cross section of expressway tunnel

On expressway tunnel with length less than 1000m, the emergency lane may not be essential; only the pedestrian walkway is required as stipulated in item 4.7.1. If the length of expressway tunnel is greater than 1000m, the emergency lane is to be arranged with 30m long sections at the interval of 500m.

On the expressway, there should be separate expressway tunnel for each traffic direction. In cross section, these two separate tunnels should have a minimum distance between two outer edges of tunnels wall equal or larger than 10m - 15m.

The dimension of the elements on the cross section of one tunnel for one direction of expressway is stipulated in item 4.7:

- The width of carriageway in tunnel B is correlative with the grades of expressway in table 1;
- The width of safety lane (S in figure 1) depends on expressway grade (table 1);
- The width of hard shoulder L (figure 1) is stipulated in 4.7.1 or 4.7.2;
- The pedestrian walkway of 1.0m width shall be 0.4m higher than the hard shoulder surface;
- The grass shoulder is not to be constructed;
- The clearance height of the expressway tunnel is stipulated in item 4.7

If the different direction of lanes is designed in one tunnel, the cross section of the expressway in tunnel is stipulated in figure 1, i.e. including 2 symmetric cross sections as stipulated in 5.13.2 with a medium at m width (refer Figure 1)

The cross section of the expressway exit/entry ramp from the right and the branch road at the interchange consist of one-way and two-way ramps.

The width of the one-way ramp pavement on the straight section is minimum of 4.0m, 7.0m for the two-way; at the curve sections, widening as stipulated in table 16 is required. In case of heavy traffic, the pavement width can be calculated by the number of necessary lanes as for usual road (see TCVN 4054)

5.14.2 The cross section of the one-way ramp consists of road pavement (as above), the safety lane of 2.0m wide on the right and the grass shoulder of 1.0m wide on both sides.

5.14.3 The cross section of the two-way extension road consists of road surface (as above), one safety lane of 1.0m for each side and the grass shoulder of 0.75m wide for both sides.

Design of expressway alignment on plan, longitudinal section and coordinated design of geometric alignment elements.

Main technical standard of geometric alignment elements of expressway grades on plan and longitudinal section is stipulated in table 4.

Items	Unit	The grade of freeway/ expressway			
		60	80	100	120
1. Calculated speed $V_{tt}$ Km/h	%	60	80	100	120
2. Super-elevation slope (or one-way crossfall) isc % not more than	M	8	8	8	8
3. The minimum radius $R_{min}$ correlative with isc = +8%,m	M	140	240	450	650
4. The minimum normal radius correlative with isc, = +5%	M	250	450	650	1000

5. The radius correlative with isc =+ 2%	M	700	1300	2000	3000
6. The radius without the structure of one-way crossfall isc = -2%	M	1500	2500	4000	5000
7- The length of the transition curve correlative with Rmin,	M	150	170	210	210
8. The length of transition curve correlative with the minimum radius,	M	90	140	150	150
9. The length of transition curve correlative with the radius with the parameter in the bracket,	M	50 (450)	75 (675)	100 (900)	125 (1125)
10. The length of braking section and the eyeshot of stopping vehicles,	M	75	100	160	230
11. Maximum longitudinal gradient of going uphill,	%	6	6	5	4
12. Maximum longitudinal gradient of going downhill,	%	6	6	5.5	5.5
13. The minimum radius of convex vertical curve radius,	m	1500	3000	6000	12000
14. The minimum radius of concave vertical curve radius,	m	1000	1 2000	3000	5000

Table 4 - Main technical standard for expressway alignments

Note: The evaluated speed  $V_{tt}$  is understood as the speed for evaluating and defining limited standards of the geometrical elements at some special locations on the expressway.

### Requirements for straight sections in alignment plans of expressway

- The length of straight alignment section shall not exceed 4km.
- The straight alignment section (measured by meter) shall be designed no more than 20-25 times of the evaluated speed (measured by km/h).
- The very long straight section shall be replaced by the curve with the small angle of turning direction and large radius (5000m to 15000m) to avoid monotony and glaring due to headlight at night.

### Select the curve radius on expressway alignment

As usually, the curve with the radius less than the minimum normal radius in row 4 of table 4 shall not be used.

When using the minimum radius  $R_{min}$  in row 3 of table 4, the approval from the investor must be obtained.

The selection of the radius of the curve  $R$  should be based on the length of the straight section  $l$  following it as follows:

- If  $l \leq 500m$ , then  $R \geq l$
- If  $l > 500m$ , then  $R \geq 500m$

Select of the radius of the curve so that the length of the curve is larger than the minimum length  $K_{min}$ :

-  $K_{min}$ , shall ensure that the driver does not need to turn direction of steering-wheel in 6 seconds, i.e.

$$K_{min} = 1.67 \times V_{tt}$$

of which

-  $V_{tt}$  is the calculated speed, measured by km/h.

-  $K_{min}$  is equal to two times of the minimum length or the connected curve L (L value in item 6.5), measured by m.

When deviation angle is less than  $7^\circ$ , the radius of the curve must be selected so that distance p and the curve length K is large enough, in particular, p shall be greater than or equal 2.0m; 1.75m; 1.50m; 1.0m and K must be greater than  $1,400/\alpha$ ;  $1,200/\alpha$ ;  $1,000/\alpha$ ;  $700/\alpha$  ( $\alpha$  is the angle of deviation, measured by degree;  $\alpha \leq 2^\circ$  is measured by  $2^\circ$ ) correlative with evaluation of 120, 100, 80 and 60km/h.

## Super-elevation on the curve

The crossfall of road pavement on the curve shall be designed to be inclined towards the inner of the curve for all curves with the radius less than the parameter in 5 of table 4. Depending on the location of R(m) between the rows 3,4; 4,5 and 5,6 of Table 4, the value of the gradient  $i_{sc}$  is defined by linearly interpolation of the values of correlative gradients at that line according to the invert of the radius ( $1/R$ ) and rounded to 0.5%.

Super-elevation (Figure 3) can be applied to two sides of the road pavement (from the safety lane of this side to the safety lane of that the other side with the same gradient) if the median has a cover. For the median without the top cover, the two carriageway pavements of two-way road surface shall have separate crossfall increase as shown in figure 3 (in this case, the drainage system must be located at the median) or it is possible to select other super-elevation method so that the level of pavement edge is suitable to the actual topography and to reduce the volume of embankment.

The super-elevation transition shall be applied on the whole transitional curve as stipulated in 6.5.2.

## The transition curve

The transitional curve of the clothoid shape with  $A = \sqrt{R.L}$  must be located between the straight alignment and the round curve with the radius less than the minimum radius without the one-way crossfall stipulated in row 6 of Table 4, with the following conditions:

- R is the radius of the round curve at the end of the transitional curve, measured by meter.
- L is the length of transitional curve, measured by meter.

Correlatively with the different radius R, the minimum length of the transitional curve L is defined as row 7, 8, 9 of table 4. If the designed radius of curve R is within the values given in brackets (row 7, 8, 9 of table 4), the length of the transitional curve is defined by linearly interpolation according to the radius R and the length L correlative with among the respective lines (the less the radius R is, the larger L is).

If the design radius R is greater than the value in bracket in row 9 of table 4, the length of the design transitional curve L shall be larger to ensure the harmony coordination with the plan elements with optical design perspective.

The parameter of the transitional curve with the clothoid shape A shall be selected as follows:

$$R \geq A \geq \frac{R}{2}$$

If the curve radius of is very large we should select A as follows:

$$R \geq A \geq \frac{R}{3}$$

## Connection between the curve sections

Two curve sections with the same direction or consecutive opposite direction will be directly connected to each other (the connected straight section is not required) if each curve has the transitional curve of the clothoid shape meeting the standard in item 6.5.2. This stipulation allows direct connection between the transitional curve of the clothoid shape on alignment. In this case the curve radius at the direct connecting point should be greater than 100m.

If due to restrictive topography, there must be a straight connecting section between the consecutive curves, the minimum length (measured by meter) of this straight section between two same direction curves is defined as 6 times of calculated speed (measured by km/h), between the curves of opposite direction is defined as 2 times of calculated speed (measured by km/h)

When connecting the opposite curve of the S shape we should use two transitory curves having the same parameter A (or not more than 1.5 times difference with parameter A) and  $R_1, R_2$  are not more than 3 times difference ( $R_1, R_2$  are the curve radius at the end of the transition curve of the curves 1 and 2).

When connecting two curves of the same direction, the parameter A should be as follows:  
 $0.5R_1 < A < R_2$ .

## Ensuring the sight distance on the curve

The obstacles in the inside of the curve on the plan must be removed to ensure the sight distance equal to the length of the stopping distance stipulated in row 10 of table 4 and the height of the driver eye-level of 1.20m and the removal section is 0.30 lower than this eye-level.

In defining the area of removing obstacles, the position of the driver's eyes on the cross section is located at 1.50m from the inside edge of the safety lane at the inside of the curve towards the carriage-way.

To increase the safety at the sections close to intersection point, the service station center or the toll station, it is necessary to ensure the minimum sight distance of 200m, 270m, 350m and 400m correlative with the expressway of grades 60, 80, 100 and 120. Ensuring the sight distance on the horizontal and vertical curves must be checked to satisfy the above minimum sight distance.

The position of finished grade on the vertical alignment.

The finished grade on longitudinal section shall be designed along the edge of road surface if the median has no cover or along the centerline (centerline of median) if the median has cover (through the turning point super-elevation gradient on the curve in figure 2 and 3).

## Regulations on vertical alignment

The maximum longitudinal gradient for the expressway grades is stipulated in row 11 and 12 of table 4. Because the expressway is one-way, in the case of separate pavement for different traffic directions with separate vertical grade, the maximum vertical grade when going down-hill is permitted to be larger than the uphill's vertical grade.

The value of longitudinal gradient is only used in the specially difficult case, the vertical grade of 3% or less (to avoid uphill auxiliary lane) is to be widely used. Particularly at the expressway sections before and after the intersections, a gradual slope should be designed (refer item 7.6 and 7.8). The vertical grade on the bridge, which span is 30m or above, and the approach bridge should not exceed 4%, the vertical grade through the tunnel of over 50m long should not exceed 3%.

The minimum vertical grade

- On the long excavated sections, the minimum longitudinal gradient must be 0.5%.
- On the transitional sections with crossfall of less than 1%, the minimum vertical grade shall be 0.5%.
- In tunnel the minimum longitudinal grade must be 0.3%

## The length of vertical slope

The minimum slope length of the freeway/expressway is 300m, 250m, 200m, 150m, correlatively with the grades of 120, 100, 80, 60 and sufficient for the arrangement of vertical curve.

The maximum slope length for the different grades on the freeway/expressway grade should be as Table 5 below:

unit: meter

The longitudinal gradient %	Grade 120	Grade 100	Grade 80	Grade 60
4	600	800	900	1000
5	-	600	700	800
6	-	-	500	600

Table 5 - The maximum slope length for the different grades on the freeway/expressway

Note:

- 1) The slope length is calculated as the total of  $\frac{1}{4}$  the first vertical curve and the straight line between 2 curves and  $\frac{1}{4}$  the following vertical curve.
- 2) If the slope is continuous by combining various slope section with different gradient, us the average slope gradient calculating method to restrict the slope length in that section.

## The vertical curve

On expressway, at the changing point of vertical curve, the vertical curve of the arc, parabolic or clothoid shape is required.

The radius of the vertical curve at different grades and its minimum length is shown in Table 6 below:

unit: meter

Item		Grade 120	Grade 100	Grade 80	Grade 60
The radius of the crest vertical curve	Minimum	12,000	6,000	3,000	1,500
	Minimum normally	17,000 (20,000)	1,000 (16,000)	4,500 (12,000)	2,000 (9,000)
The radius of the sag vertical curve	Minimum	5,000	3,000	2,000	1,000
	Minimum normally	6,000 (12,000)	4,500 (10,000)	3,000 (8,000)	1,500 (6,000)
The minimum length of vertical curve		100	85	70	50

Table 6 - The radius and the minimum length of the vertical curve on expressway  
The radius of greater than minimum value should be applied; the minimum value is used in the specially difficult case. If the angle of changing slope is less, select the larger radius. The values in brackets in table 6 are the radius of the vertical curve meet with the requirements of vision and we should design the vertical curve of those radius if favorable.

Avoid the short slope section between the vertical curves of the same direction (especially the same concave direction curves).

## Designing co-ordination of alignment elements

To ensure safe and economic traffic on expressway, the expressway alignment must be designed harmoniously to the topography, landscaping, assisting the driver to have good vision and recognize the alignment clearly. Therefore, verification and evaluation of the alignment coordination in space must be carried out by perspective photograph, firstly at the section with the simultaneously change of plan and vertical grade, then the sections at the intersections or the section with special topography and geophysics on both sides.

To make alignments continuous, smooth and clear in space, the regulations and instructions of designing the elements of plan and vertical grade shown in 6.2, 6.3, 6.5, 6.6, 6.7, 6.12 shall be obeyed. The high levels should be applied to these elements so as to provide good guidance of direction to drivers naturally.

Coordination of vertical and horizontal curve

- The vertical and horizontal curve must be located coincidentally with the length of horizontal curve greater than the length of the vertical curve and the deviation of their peaks is not larger than 1/4 of the shorter curve length.

- The radius of the vertical curve should be 6-time greater than the radius of the horizontal curve.
- Avoid connecting the end of the horizontal curve with the beginning of the convex or concave vertical curve (the vertical curve on the straight section).
- The vertical curve with the small radius must not be located in the transition curve.

Avoid locating many slope-changing sections on one long straight section. Avoid locating the concave vertical curve with shoe length and convex vertical curve with small radius on a straight line. Avoid locating the turning location at the steep slope area.

Co-ordination of expressway alignment and bridge and tunnel

- The location and the shape of the bridge is in attempt to satisfy the requirements of the coordination of alignment elements. The curve bridge, slope bridge, skew bridge are to be used, if necessary, to ensure the continuity and smoothness of expressway alignment on bridge.
- Design the straight alignment in tunnel; if the alignment in tunnel is on curve, the radius without one-way crossfall must be used and this radius must meet with the requirement of stopping distance on the curve (row 10 of table 4).
- The elements on plan and longitudinal section at the two ends of bridge or tunnel need the minimum section of 10m with the same arrangement as that on the bridge or in tunnel.

## The expressway design is to be coordinated with landscaping

When selecting expressway alignment, use natural scenery such as hills, mountains, lakes, plants and architectural works (dike, rural housing etc.) to avoid the monotonous feeling.

Avoid destroying the topography, natural geomorphology and landscape: using alignment to emphasize the natural curvature of natural topography; growing plants to minimize the impact of excavation or embankment on the both sides of the road.

Avoid growing the same plants on both sides of the road: using tall trees to emphasize and guide directions, short trees to cover; single large trees or group of plants for landscaping purpose etc.

If expressway goes through the forest, avoid straight alignment to minimize the effect of inflexibly separating the forest. Start with the curve from the outside of the forest and arrange group of plants with the increasing density on the transition sections to the forest.

Through hills, expressway alignment should have the curve with the large radius and the large bending of topography. Should not rely too much on the local small curvature. Restrict high embankment, deep excavation. The best way is to use the whole clothoid alignment to avoid break on longitudinal grade and plan which is caused by hilly topography.

For the topography of bald hills, we should grow plants at two sides of road.

For the plain topography, the selection of alignment must follow item 5.2



Expressway alignment on mountain should have retaining walls, road of balcony style, viaduct, type of crossfall and reinforcement measures that have decorative effects to make alignment continuous, smooth and clear.

Besides, the method of separating alignment of two carriage-way directions shall be applied to mountainous topography to suit the topography and reduce high embankment and deep excavation.

Design of intersection on expressway and entry/exit point to expressway

### Classification of intersection on expressway

Functionally, the intersections on expressway are divided into three types:

- The intersection without in-coming/out-going point at freeway/expressway (called grade-separated junction). These are the intersections between expressway with railway, pipeline, pedestrian walkway (underpass or overpass the expressway) or other public roads which entry/exit to the expressway is not permitted.
- The intersection with in-coming/out-going point at expressway - (called level crossing). These are the intersections between expressway and highway of different grade which we can entry/exit the expressway and intersections between expressway and roads to airports, ports, railway station, cities, political and economical centers, industrial zones, mines, scenery, resorts, service centers along the expressway.

The connecting intersections on expressway should only be located at the junction of maximum 4 road branches, i.e. only T-junction, or crossing are accepted for the ease of concentrated toll station installation.

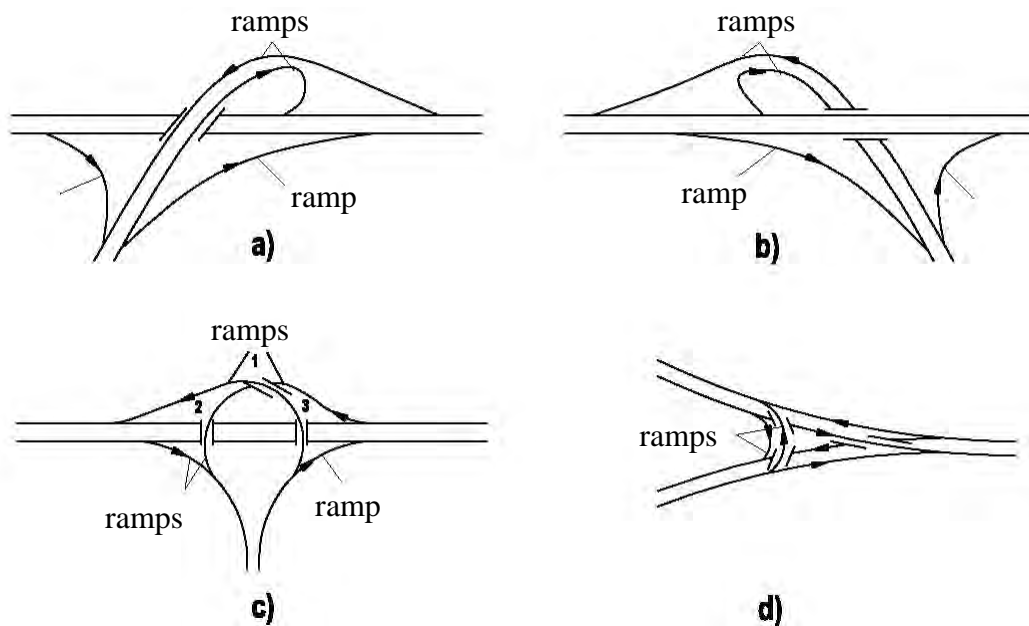
- The intersections on freeway/expressway is only the entry/exit point on the right side.

Expressways of both types of intersection (grade-separated junction and connecting intersection) in item 7.1 require intersection in principle of no at-grade intersection point on the whole freeway/expressway. However, in the area of intersection, depending on economical and technical study, the level crossing with other roads (two lane road and grade III or below) can be permitted.

If intersection is only an entry/exit ramp on the right, the design shall follow the requirements as for the ramps on the connecting grade-separated interchanges \*refer to 7.7).

### Selection of connected interchange types

At three-branch intersections (T-intersection location), the types of grade-separated interchange can be chosen in figure 5.



Note: a, b - Trumpet interchange, c - T shape interchange, d - Y shape interchange

Figure 5 - Basic types of three-branch interchange

The trumpet interchange in figure 5a and 5b have advantage as follows: only one flyover is needed to ensure there is no crossing and mixing of traffic in the area of interchange (only have split and merge traffic), nice topology, driver can recognize direction easily. But the disadvantage of this type is the existence of indirect and semi-direct left turn stream has to travel a long distance which needs a large area to ensure the vertical slope for all ramps. This type of interchange is suitable for crossing between two expressways or between expressway and highway of 4 lane of grade I-III (i.e. crossing between the roads does not permit any crossing between the traffic flows).

The T and Y shape interchanges (figure 5c and 5d) have advantage as follows: the route to go through the intersection is shorter than trumpet one (especially Y shape); thanks to good ramp aspects, high traffic capacity and speed can be achieved; there is no indirect turn and land acquisition is reduced. The disadvantage of this type is that the construction cost is high due to the construction of 3 flyovers. However in case the expressway crosses over low grade roads (Fig 7.2), the number of flyovers can be reduced and crossing with exit/entry ramp to low grade roads can be permitted (Fig 5c). If the North-South is low grade auxiliary road, it is possible to combine Bridge 2 and 3 into one and remove Bridge 1; accept the crossing at 1 or in Figure 5d, it is possible to remove 1 certain bridge on the low grade auxiliary road.

In three-way intersection area, it is always possible to arrange closed toll collection system with only one toll plaza located at the lower grade road (if all crossings are expressways, locate the toll stations on the branches with lower traffic flow).

At four-way intersection, if toll plaza is not necessary, the types of grade-separated interchange can be chosen in figure 6. In figure 6a, 6b and 6e, if freeway/expressway crossing over a highway of 2 lanes (of which grade is lower than III), only two flyovers are necessary (level crossing with low grade road is

acceptable). The remaining types are suitable for crossing over between two expressways, each one has at least 4 lanes and grade I-III.

The advantage of each type of interchange can be seen by total number of flyovers to be constructed, the total road length through interchange and the ability in assisting the driver to recognize the traffic direction.

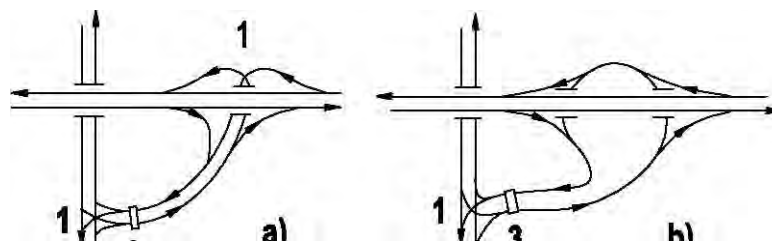


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a- Lozenge interchange, b- half-asterisk interchange, c- spiral interchange, d: asterisk interchange, e- bracelet interchange, d- half-spiral interchange

Figure 6 - Basic types of four arm intersection interchange in which toll plaza is not constructed

At four-way arm intersection, if closed tolling system is in use, only one toll plaza shall be constructed. In this case, grade-separated connected interchange types in figure 7 can be applied; whereas Figures 7a, 7b, 7c and 7d (intersection with lower grade highway), is suitable for connected intersections between the expressway and with highway of 2 lanes or less (grade I-III). Figures 7e, 7f, 7g and 7h is suitable for connected interchanges between two expressways, expressway with highway with at least 4 lanes and grade I-III.



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Note:

1- at-grade intersection on ramp; 2- three layer interchange; 3- location of toll plaza.

Figure 7 - Basic types of four-way intersection with toll plaza

Not restricted to the above basic types, the suggestion of grade-separated connected interchange is the creativity of the designer based on the traffic scope of the branches with consideration the conditions of site topography and geophysics. In proposal phase, the type of interchange shall be considered with the below analysis:

- Consider turn direction in priority order: direct turn left for heavy traffic stream, semi-direct, or indirect left turn for medium or small traffic stream. Similarly, priority is given to the short turn length for heavy traffic.

- Three-level grade-separated intersection may be considered for the traffic of more than 6.000 PCU/day to reduce the travel length and time or to overcome the difficult topography.
- In all case, before any comparison, the traffic capacity should be audited to ensure the traffic capacity of branch road (by using the usage ratio of traffic capacity in item 4.2.2 of TCVN 4054), the mix traffic section, the level crossing in the area of grade-separated connected interchange and ensure that they meet the technical requirement on geometrical elements as mention in item 7.7 of this standard and in chapter 11 of TCVN 4054.

The design of grade-separated connected interchange should be based on the comparison study of general technique and economy of each option by the following criteria:

#### 1. Technical specification:

- Land area for right of way (ha);
- Total length (converted to one lane) of all branches in interchange area (km);
- Total length (converted to one lane) of main road in interchange area (km);
- Total surface area of all branches (m<sup>2</sup>);
- Total surface area of main road in the area of the interchange (m<sup>2</sup>);
- Total length (convert to one lane) of flyover and underpass in interchange area (m);
- Total quantity of earthwork(m<sup>3</sup>).

#### 2. Operating specification

- Travel time for left and right turn at design speed (second). (travel time is the time for travelling between two fixed points in the through road for comparison of various options)
- Total time for passing through interchanges in all direction per day (PCU hour/day). This criterion is calculated by the product of travel time on straight direction, left turn, right turn and number of PCU on straight direction, left turn, right turn, correlatively with each trip which is fixed by the same locations for all the comparison options.

#### 3. Economy specification:

- Total construction cost (VND);
- Average maintenance cost in 1 year (VND)
- Average operation cost in 1 year (average in the entire operation period) (VND)

From the above criteria, it is possible to calculate the capital recovery duration of a high cost construction project but the maintenance and operation cost is small with a contrary option.

### Stipulation of the distance among grade-separated connected interchanges

The minimum distance between grade-separated connected interchange and the entry/exit ramps from the right-hand side is 4 km. However, it is necessary to consider the solution of mixing the very close intersections into 1 such as 7.4.2.

The distance between grade-separated connected interchanges (the distance between entry and exit points of expressway) should be from 15km to 25km by constructing auxiliary road to combine the very close intersections into one point; for expressway sections around major cities or important industrial zones, this distance can be from 5km to 10km.

If the distance between grade-separated connected interchanges is more than 30km, we must locate the turning point at the break of the median at the special positions. At that location, signage or management personnel is required to instruct the wrong-direction vehicles, maintenance and emergency to U-turn.

The minimum distance between grade-separated connected interchange and rest, servicing areas along the expressway must be from 3km to 5km with the minimum tunnel opening of 1.5km-4km.

The requirements for other highways connecting with grade-separated connected interchange on expressway:

These highways must ensure sufficient traffic capacity to avoid negative impacts to the through traffic of connected alignments. Besides, it can gather and distribute traffic to the neighbor road network or directly connect with the heavy traffic locations.

In the area of grade-separated connected interchange, apply the technical standards in table 7 for expressway (especially for the expressway running underneath); usually use the radius larger than or equal to the normal value and the vertical grade smaller than or equal to the normal value in Table 7.

The grades of expressway		120	100	80	60	
The minimum radius of the horizontal curve	Normally	2,000	1,500	1,100	500	
	Limited	1,500	1,000	700	350	
The minimum radius of the vertical curve	Convex	Normally	45,000	25,000	12,000	6,000
		Limited	23,000	15,000	6,000	3,000
	Concave	Normally	16,000	12,000	8,000	4,000
		Limited	12,000	8,000	4,000	2,000
The largest longitudinal gradient, %	Normally	2	2	3	4.5	
	Limited	2	2	4	5.5	

Table 7 - Technical standards for freeway/expressway at the connecting elevated

Design requirements for the ramp in the area of the grade-separated connected interchange and the entry/exit ramp on right side of expressway.

The cross section of these ramps must be arranged as item 5.14

Calculated speed on the ramps in the area of grade-separated connected interchange is stipulated in Table 8.

Measured by km/h

Characteristic of grade-separated connected interchange	Grade of expressway			
	120	100	80	60
Transport connection between expressway and highway of grade I, II	80÷50	70÷40	60÷35	50÷35
Transport connection between expressway and other road	60÷35	50÷35	40÷30	35÷30

Table 8 - Evaluated speed on the extension road

Note:

- 1) For the right or left turning branch road, use the factor of calculated speed between the parameters in Table 8 or above.
- 2) For the branch roads of asterisk or spiral type, the low parameter in table should be used.
- 3) For the branch road with heavy turning traffic and outgoing roads, select high evaluated speed.

The calculated speed on the entry/exit ramp from the right side of the expressway should follow its design grade and the geometrical specification of this ramp should be applied in accordance with its design grade (comply with TCVN 4054). If design speed is similar to table 8, the geometry specification is applied as for branch road located within the area of grade-separated connected interchange (7.7.5).

The above-mentioned value of calculated speed is used to define the geometrical elements of branch road alignments on plan and vertical alignment according to TCVN 4054 and current traffic interchange design standards (the minimum radius, the length of transition curve, the widening of curve, super-elevation, the maximum longitudinal grade, reduction of slope on curve etc.). During the design, avoid applying the minimum and maximum factors to those elements and pay attention to the fact that traffic speed often change gradually on branch road.

Depending on the calculated speed of table 8, the geometrical elements of ramp on grade-separated connected interchange should obey the specification in table 9 (regarding curve radius); table 10 (regarding parameters of clothoid transition curve); table 11 (regarding vertical slope); table 12 (regarding vertical curve elements); table 13 (super-elevation); table 14, 15 (regarding transition of super-elevation); table 16 (regarding widening on curve); table 17 (regarding stopping sight distance).

Evaluated speed on ramps in the area of interchange (km/h)		80	60	50	40	35	30
Minimum radius of curve (m)	Normal value	280	150	100	60	40	30
	Low limited value	230	120	80	45	35	25
Note: the normal value shall be used except when the interchange is located in difficult topography.							

Table 9- Minimum curve radius of branch road in grade-separated connected interchange

Calculated speed on branch road in the interchange (km/h)	80	60	50	40	35	30
Parameter A (m)	140	70	50	35	30	20
Note: 1) The length of clothoid transition section should follow the requirements of super-elevation connection; 2) Parameter A shall be chosen as $A \geq 1.5R$ (R - radius of designed curve); 3) Two curves in opposite direction should have the same parameter A or their ratio shall be less than 1.5.						

Figure 10- Clothoid parameters on branch road (for calculating the length of transitional clothoid)

Calculated speed on ramp at the intersection (km/h)	Maximum vertical slope (%)
80	4.0
60	5.0
50	5.5
$\leq 40$	6.0

Table 11- Maximum vertical slope in interchange

Calculated speed on ramp in the interchange (km/h)			80	60	50	40	35	30
Minimum radius of vertical curve (m)	crest	normal	4500	2000	1600	900	700	500
		low limit	3000	1400	800	450	350	250
	sag	normal	3000	1500	1400	900	700	400
		low limit	2000	1000	700	450	350	300
Minimum length of vertical curve (m)	normal	100	70	60	40	35	30	
	low limit	70	50	40	35	30	25	
Note: Except for specially difficult case, the normal value or above shall be used.								

Table 12- Minimum radius and length of vertical curve in interchange

Evaluated speed on branch road (km/h)	80	60	50	40	35	30	super-elevation (%)
	230 ~ 330	120 ~ 180	80 ~ 120	45 ~ 70	35 ~ 50	< 30	8
	330 ~ 380	180 ~ 220	120 ~ 160	70 ~ 90	50 ~ 60	30 ~ 40	7 ~ 8
	380 ~ 450	220 ~ 270	160 ~ 200	90 ~ 130	90 ~ 110	40 ~ 60	6 ~ 7
	450 ~ 540	270 ~ 330	200 ~ 240	130 ~ 160	90 ~ 110	60 ~ 80	5 ~ 6
	540 ~ 670	330 ~ 420	240 ~ 310	160 ~ 210	110 ~ 140	80 ~ 110	4 ~ 5
	670 ~ 870	420 ~ 560	310 ~ 410	210 ~ 280	140 ~ 220	110 ~ 150	4
	870 ~ 1240	560 ~ 800	410 ~ 590	280 ~ 400	220 ~ 280	150 ~ 220	3
	> 1240	> 800	> 500	> 400	> 280	> 220	2
Radius without super-elevation	2500	1500	1000	600	500	350	No change

Table 13- Super-elevation on curve branch road

Pavement type and location of super-elevation axis	One-way single lane		One-way double lanes and two-way double lanes (not separate pavement type)	
	Pavement edge	Centerline	Pavement edge	Centerline
Calculated speed on branch road (km/h)				
80	1/200	1/250	1/150	1/200
60	1/200	1/225	1/125	1/175
50	1/200	1/200	1/100	1/175
≤ 40	1/100	1/150	1/100	1/150

Note: the location of super-elevation connection should overlap the clothoid transitional section. The length shall be chosen as the large value from the results calculated from table 10 and table 14.

Table 14- The changing rate of super-elevation on branch road of interchange (for determining the transitional length)



Type of branch road cross section		One-way single lane	One-way double lanes and two-way double lanes
Location of super-elevation axis	Centerline	1/800	1/500
	Shoulder	1/500	1/300

Table 15- The minimum changing rate of super-elevation to determine the super-elevation length of branch road of which the crossfall is 0%

Branch road of one-way single lane		Branch road of one-way double lane or two-way double lanes	
Radius of curve (m)	Extension parameter (m)	Radius of curve (m))	Extension parameter (m)
25 ~ < 27	2,00	25 ~ < 26	2,25
27 ~ < 29	1,75	26 ~ < 27	2,00
29 ~ < 32	1,50	27 ~ < 29	1,75
32 ~ < 36	1,25	29 ~ < 31	1,50
36 ~ < 42	1,00	31 ~ < 33	1,25
42 ~ < 48	0,75	33 ~ < 36	1,00
48 ~ < 58	0,50	36 ~ < 39	0,75
58 ~ < 72	0,25	39 ~ < 43	0,50
≥ 72	0	43 ~ < 47	0,25
-	-	≥ 47	0,00

Note: The extension of main branch road is not including the extension of safety lane as mention in 5.14.2 and 5.14.3

Table 16- Extension parameter of curve branch road

Evaluated speed on branch road (km/h)	80	60	50	40	35	30
Sight distance (m)	110	75	65	45	35	30

Table 17- Sight distance on branch road

When applying the parameters in tables 9-17 above, the linear interpolation between the ranges of calculated speed is acceptable.

In asterisk interchange (figure 6e), the minimum radius should be 55-60m, 40-50m, 30-35m for correlative calculated speed on ramp of 40km/h, 35km/h, 30km/h.

Locate the connection between the ramp and expressway (the entry/exit point to expressway) in the area of grade-separated connected interchange and the entry/exit from the right-hand side.

Locate this connection from the right side of traffic direction. The exit ramp from expressway must be visible, often located in the front of man-made works (such as crossing bridge etc.). If it must be located after the manmade works, it should be more than 150m away from the bridge. Besides, the exit location on the uphill section of the expressway should be provided to assist the deceleration.

The location from the auxiliary lane to the expressway should be located on the section of downhill slope (to assist the acceleration) and it is necessary to ensure a clear space of triangle shape between two roads to allow vehicles on expressway and ramps can recognize each other. This triangle has its peak as the intersection between the edge of the right pavement edge of the expressway and left pavement edge of the ramp. The side of the triangle along the right pavement edge of the expressway is 100m and the side along the left pavement edge of the ramp is 60m (figure 8).

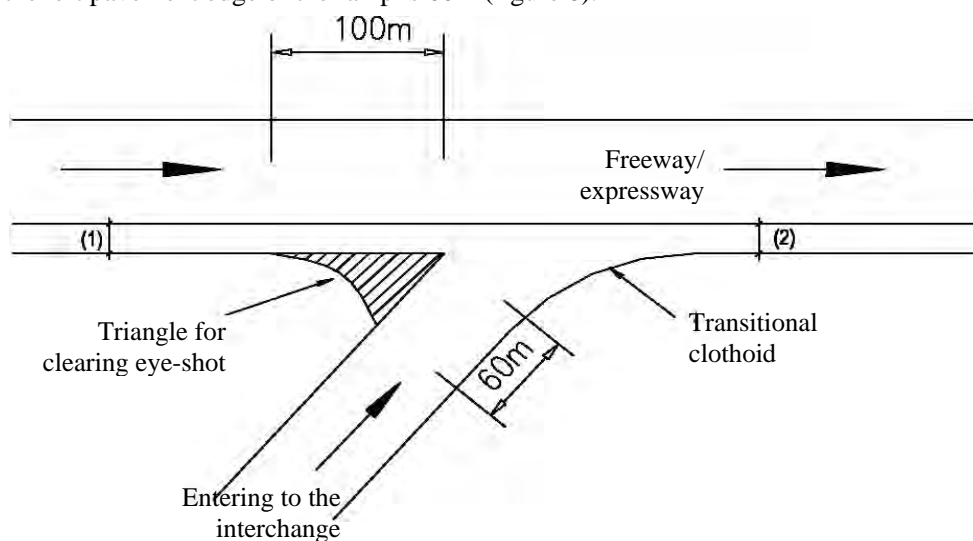


Figure 8 - The triangle for eye-shot at entry/exit point of interchange

Ensure the sight distance on the expressway at the section before the lane-split section at the exit ramp is more than 1.25 times of the stopping-sight distance in table 4 and follow the required stopping-sight distance in item 6.8 if possible.

The out-going section from freeway/expressway can be arranged according to two parallel ways or connecting directly as figures 9.

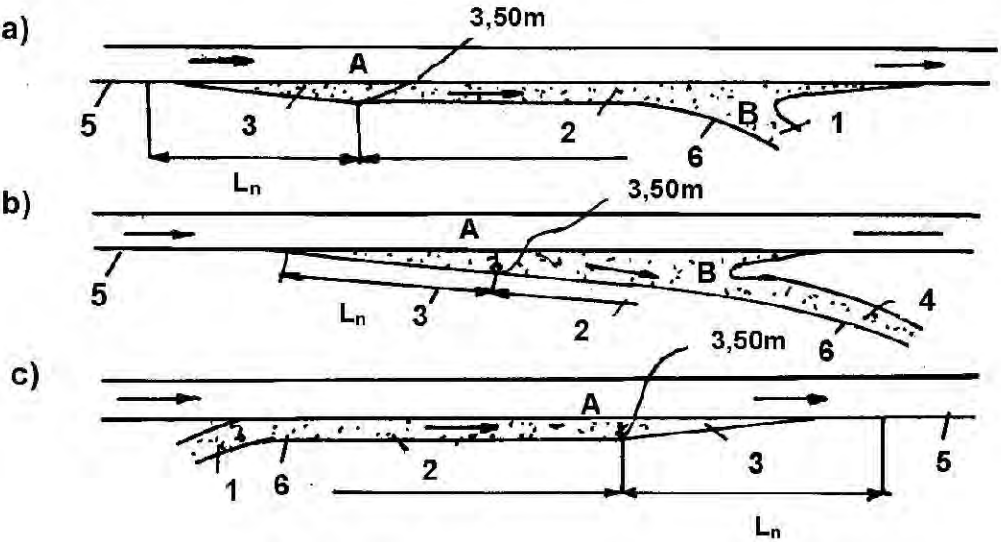


Figure 9 - The ways of locating out-going and in-coming section

- a) The exit section with the parallel type
  - b) The exit section with the direct connection type
  - c) The entry section with the parallel type
- Curve radius at B:  $r = 0.60m - 1.00m$
- 1 . The branch road
  - 2. The speed-changing section (deceleration in figure a and b; acceleration in figure c).
  - 3. The triangle lane-changing section (refer definition in 7.8.6)
  - 4. The branch road with the function of changing lane and speed.
  - 5. Edge of carriageway (excluding shoulder) of the expressway.
  - 6. Clothoid transition section, as 7.8.1
- $L_n$  : lane-changing section in triangle shape.

For the entry to expressway (merging location), follow the parallel style (figure 9c) with the whole length of the acceleration section to be located next to the carriage-way on expressway (widen the shoulder); if the acceleration section is too long, at least 100m of the section must be located next to the carriage-way of the expressway. In the case there is two traffic lanes in the entry road, it is possible to have the entry of direct connection type.

The width of a speed-changing lane in all cases is stipulated as 3.50m. The length of triangle lane-changing section in all cases includes the widened carriage-way of 3.50m (if the speed-changing section has 1 lane) and 7.0m (if 2 lanes). 2-lane speed-changing section occurs when the expressway has 6 traffic lanes.

The minimum length of the triangle lane-changing section (including the case of entry/exit to the expressway) is defined in accordance with the grades of expressway as shown in table 18; in case the lane-changing section has two lanes, the value of  $L_n$  in Table 18 should be multiplied by 1.3 – 1.4 times

Grades of freeway/ expressway	120	100	80	60
$L_n$	75	60	50	40

Table 18 - the minimum length of the triangle lane-changing section (current separating or joining)

The acceleration/deceleration section is calculated from the point A (beginning or end of triangle section) in figure 9 and its length  $S$  (measured by meter) is defined according to the formula below:

$$S = \frac{V_A^2 - V_B^2}{26.a}$$

of which

-  $V_A$  is the vehicle speed at the point A (end of the lane-changing section with triangular type) in figure 9, measured by km/h; the value A is based on the grades of expressway in table 19.

Unit: km/h

Grades of freeway/expressway	120	100	80	60
$V_A$	130	170	160	150

Table 19 - The value of the speed  $V_A$  at the beginning of the deceleration section or the end of the acceleration section.

-  $a$  is the acceleration of increasing or reducing speed, measured by m/sec'

When defining the length of the deceleration, use  $a = 2.5\text{m/sec}^2$ , for the length of the acceleration,  $a = 1.0\text{ m}$

-  $V_B$  is the speed at the end of the deceleration section or the beginning of acceleration section, measured by km/h.

The value  $V_B$  is based on the calculated speed of branch road (item 7.7.2 and 7.7.3) or based on the actual geometrical elements applied to branch roads in specific design after the deceleration section or before the acceleration section.

If the triangle lane-changing section with the deceleration section are located on the downhill section and the triangle lane-changing section with the acceleration section are on the uphill section, their length as defined in table 18 and item 7.8.8 must be multiplied by an adjustment factor in table 20:

The average grade of the speed-changing lane, %	$\leq 2$	$>2\div 3$	$> 3\div 4$	$> 4\div 6$
The factor for the downhill speed-changing lane Down	1.0	1.1	1.2	1.3
The factor for the uphill speed-changing lane slope	1.0	1.2	1.3	1.4

Table 20 - Adjustment factor of the speed-changing lane length on the slope

In all cases, depending on the expressway grade, the total length of the lane-changing (triangle type) plus the length of the speed-changing section (reducing or increasing speed) should be larger than the value in table 21 multiple with adjustment factor in table 20.

Grades of expressway	120	100	80	60
The minimum length at exit point (reducing speed) of one lane, m	100 (150)	90 (130)	80 (110)	70 (90)
The minimum length at entry point (increasing speed) of one lane, m	200 (300)	180 (260)	160 (220)	120 (160)
Note: the value in brackets is correlative with 2-lane speed-changing section				

Table 21 - The minimum value applied to the total length of the lane-changing section plus the speed-changing section.

On the direct connected deceleration section (section 2 and 6 in Figure 9b) or at the location where the deceleration begins to be far away from the expressway (section 6 on Figure 9a) and at the merging location to acceleration section running parallel with the expressway (section 6 in Figure 9c), apply all the geometric design standards in 7.7.5, correlatively with the speed  $V_A$  depending on the expressway grade as shown in Table 19 for all cases without depending on the calculated speed of the branch road. Arrange the transitional connection by clothoid curve as mentioned in figure 9.

Crossfall and Super-elevation arrangement at entry/exit of expressway

1. If the entry/exit point is on the straight section of expressway and the lane-changing section is also on straight section (figure 10a), the crossfall on the entire section (1) and (2) is still one-way as the usual slope of the expressway. From point ZH, the branch road is designed and connected with super-elevation in accordance with branch road design standard (table 14, 15).
2. If the entry/exit point is parallel with expressway straight section (figure 10b), the section from (1) and (2) to point A (the branch road begins to be away from the expressway) have normal super-elevation value of expressway. From point A, the super-elevation will comply with the branch road standard.
3. If the entry/exit point is of parallel type, located on the curve which has same direction with the expressway (figure 10c, 10d), the super-elevation on section (1) and (2) is design with normal super-elevation value of expressway carriageway.
4. If the entry/exit point is directly connected on the curve which has opposite direction with expressway (figure 10e), the super-elevation value on section (1) is the same as the super-elevation value of expressway. The super-elevation on section (2) is gradually transitioned to the super-elevation value of less than 2% and have opposite direction with expressway super-elevation so that the difference in crossfall value at point A is not larger than 5% and then the super-elevation of section (3) is transitory to the design super-elevation of branch road.
5. If the entry/exit point is parallel connected on the curve which has opposite direction with the expressway curve (figure 10g), the super-elevation from section (1) and a part of section

(2) to the point ZH is same value and direction with expressway super-elevation. The super-elevation at point A is transitory to the value of less than 2% (opposite direction with the expressway super-elevation) so that the difference in crossfall value at point A is not larger than 5%. The super-elevation on section (3) is transitory to the super-elevation of branch roach.

When design the transition for super-elevation, the requirements in Table 14 and 15 should be complied.

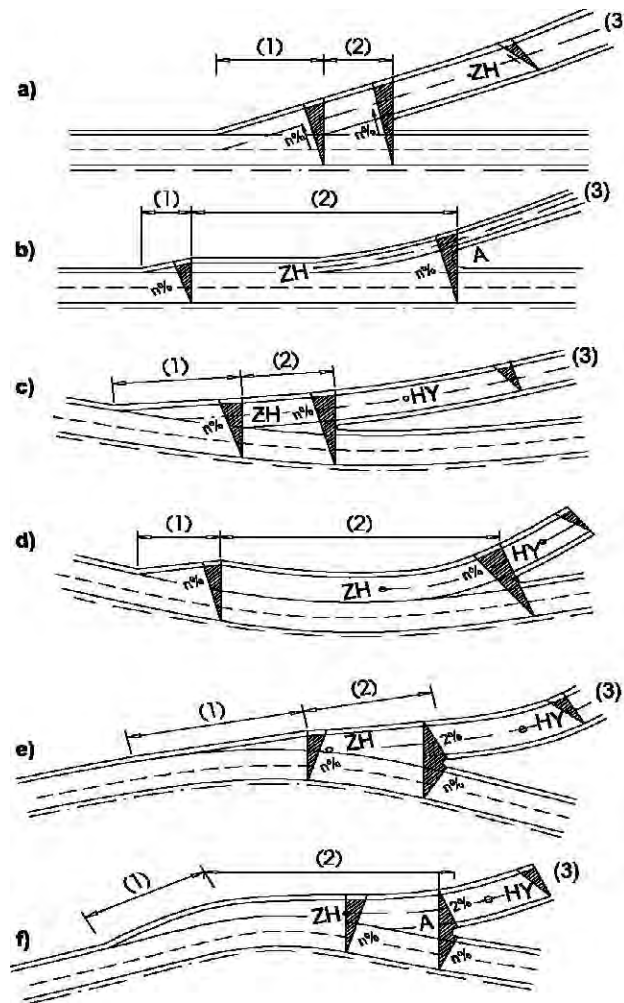


Figure 10 - Super-elevation at out-going, in-coming point

Note:

- |                            |  |
|----------------------------|--|
| 1. Triangle lane-changing; | ZH: beginning point of curve;                      |
| 2. Speed-changing lane;    | HY: ending point of curve;                         |
| 3. Curve branch;           | A: start point of far away from freeway/expressway |

Balancing the number of lanes and arranging auxiliary lane at entry/exit point of expressway

1. On the whole length or section length of expressway, the number of basic lanes should be ensured.

The increasing or decreasing of basic lanes of 2 consecutive road sections in the same direction should not be more than 1 lane, the changing number of lane should be in the

location of no less than 0.5-1.0km from the grade-separated connected intersection and arrange the transition section with the gradually changing factor of no more than 1/50. The location for lane splitting/merging must be calculated based on the below balancing formula to experiment the balancing of number of lanes

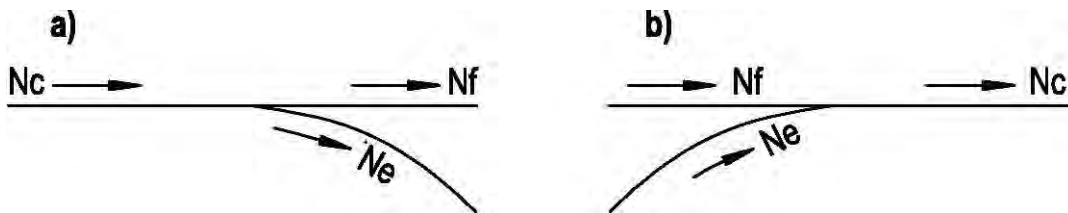
$$N_c \geq N_f + N_e - 1$$

in which:

$N_c$ : Number of lanes on main roads before splitting lane or after merging lane;

$N_f$ : Number of lanes on main roads after splitting lane or before merging lane;

$N_e$ : Lane number of branch road



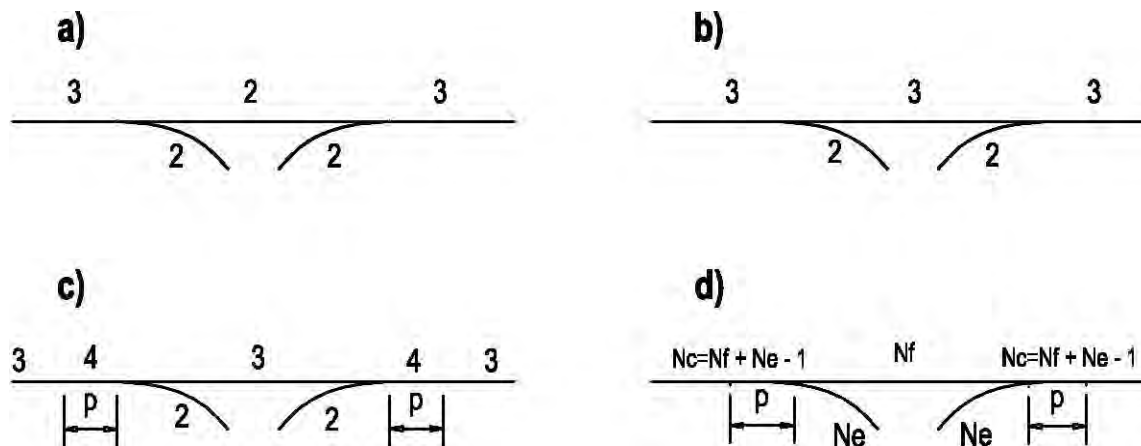
Note:

a) Lane-split to exit from expressway, b) lane-merging to enter expressway;

Figure 11 - Balancing lanes checking scheme

## 2. Arranging auxiliary lane

When arranging the lane split/merge for 2-lane branch road, the continuity of basic lanes should be kept; keep the balancing of number of lanes; increase the number of auxiliary lane when necessary as shown in figure 12



Note:

a) Balancing the number of lanes but the continuity of number of basic lanes is not ensured;

b) The number of basic lanes is continuous but not balancing the number of lanes;

c) Balancing number of lanes and ensuring the continuous number of basic lanes

d) Conditions for continuous number of basic lanes;

p: Section needs additional auxiliary lane to ensure the balancing and continuity

Figure 12 - Checking diagram on balancing lanes and continuity of basic lanes

For smooth traffic, the length of auxiliary lane p at the beginning of lane-split section shall be 1000m (minimum 600m); at lane-merging section shall be 600m.

When the distance between the end of acceleration lane of grade-separated connected interchange at the front and the beginning of deceleration lane of the grade-separated connected at the back is less than 500m, the auxiliary lane must be added to connect them together. If the traffic volume is relatively high, the flow mixing rate is quite high, the auxiliary lane is required even the above distance is larger than 2000m. Therefore, if there are two connected interchanges with distance less than 2000m, the auxiliary lanes shall be constructed to connect them together. The arrangement of auxiliary lane on cross section is mentioned in item 5.9.

### Design of landscape, trees and drainage system in the area of grade-separated interchange

At the grade-separated connected interchange, Inundated water should not be allowed within the area of curved branch roads.

Landscaping designing at the batter

The fill batter on branch road should have gradually gentle slope to the existing surface.

In the area of grade-separated connected interchange, various types of trees should be grown: at the entry/exit sections, grow the direction-guiding trees. On one side of lane-split location, grow shrubs to restrict sight-distance to indirectly make the drivers reduce speed.

In the triangle area of the turning location of branch road, grow flowers, grass. When growing the shrubs in the inner side of curve section, the sight distance should meet the requirements of sight distance and have the effect of direction guidance as shown in figure 13.

The drainage system in the area of grade-separated connected interchange should be consistent with the expressway drainage system to create a comprehensive drainage system.



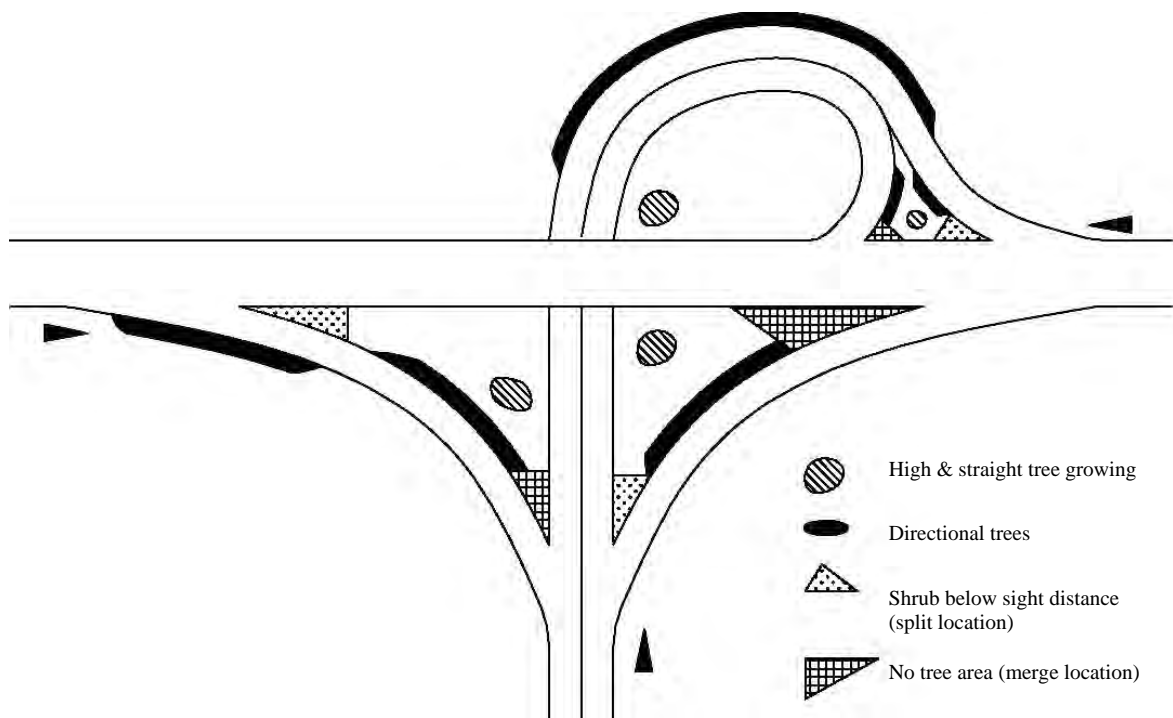


Figure 13 - Tree planning

Design requirements for at-grade intersection on low grade road (refer in 7.2) within the area of grade-separated connected interchange.

This design should comply with requirements for at-grade interchange mentioned in chapter 11 of TCVN 4054 and other related standards, for selecting intersection type, design speed, geometric elements arrangement and ensuring the arrangement of sight-distance, island, speed-change lanes and traffic sign.

### Arrangement of grade-separated intersection

The design of grade-separated non-connected intersection as mentioned in item 7.1, 7.2 must follow the stipulation of overhead clearance over and under the expressway in item 4.7 and 4.9. If the expressway crosses over the residential roads without any grade, the determination of clearance height will be based on the actual traffic condition. If there is not much car traffic, clearance height of the residential roads can be reduced to 3.20m. If the road is just for tractors, the overhead space limit can be reduced to 2.70 and only 1 lane is required.

It is necessary to have comparison study of expressway options for flyover or underpass. In every case, the arrangement of bridge span and length (including the location of abutment and pier) must ensure the sight distance of the traffic on the road underneath. Should not construct concave vertical curve on the expressway at the location with a flyover.

The drainage system and the lighting at the underpass should be sufficient.

The angle between the flyover and road underneath should be larger than  $45^{\circ}$ .

It is not permitted to have grade-separated junction between the expressway and railway in the area of railway station or switch location.

The intersection between expressway and pipeline, other lines (power, communication etc.) and the reciprocal position among them outside or inside the area of intersection should follow TCVN 4054 and other requirements from the Authorities.

Design of expressway pavement and drainage system

## General requirements

In order to ensure the continuous traffic performance, safety of traffic, the pavement of expressway must be strong and stable to avoid the negative effect of environment (especially from underground and surface water). The surface of expressway must be flat and have sufficient roughness with good drainage system.

Regarding pavement and drainage, besides the requirements in this standard, it is necessary to meet the basic requirements and design principles and other requirements in TCVN 4054.

Regarding road pavement, besides the compliance with TCVN 4054, it is also necessary to meet the requirements and guidance of 22TCN 211 (flexible pavement) and 22TCN 233 (rigid pavement).

For the section in soft ground area, the remaining permissible settlement at the road centerline after the construction should follow 22TCN 211 and the design survey follow 22TCN 262.

The structure of pavement should not be implemented in staged investment. In special case, when the expressway embankment is located in soft soil area which have high settlement rate, the staged investment shall be considered through economic study to lay the cover layers depending on settlement time to reduce investment cost. This proposal must be approved by the investor.

## Design of pavement

The design of expressway pavement should be based on the sufficient and trustful investigation of geology, hydrology to ensure the stability of road pavement in the below cases:

- High embankment and deep excavation with batter height of over 12.0m;
- Excavation in the rock area, erosion area, rock rolling area, and the area of difficult geology and hydrology (hillside, weathered soil condition, swamp, soft ground with underground water, hillside with steep crossfall)
- Pavement close to river, creek with high possibility of erosion.

The design of batter

1. To ensure the requirements of safety for hi-speed vehicles, avoid erosion and rock rolling and landscaping requirements, the pavement of expressway should be designed with the batter slope in accordance with Table 22. If land area is limited, the retaining wall or rock filling can be use to replace fill batter. The design of batter on the mountain areas which have high slope

angle, difficult topography and steep rock embankment, the batter slope can follow TCVN 4054.

Embankment height or excavation depth	Fill embankment slope	Cut embankment slope
to 1.2m	1 : 4 (1 : 3)	1 : 3.0
≥ 1.2m ÷ 3.0m	1 : 3 (1 : 2)	1 : 2.5 (1 : 2)
≥ 3.0m ÷ 4.5m	1 : 2.5 (1 : 1.75)	1 : 2.0 (1 : 1.5)
≥ 4.5m ÷ 6.0m	1 : 2 (1 : 1.5)	1 : 1.75 (1 : 1.5)
over 6.0 m	1 : 2 (1 : 1.5)	1 : 1.5

Note:

- The value in bracket is correlative with the case of difficult topography or limited land area;
- the design batter slope varies within the embankment height values in Table 22 (the type of embankment that is gentle slope at toe, steep slope on top)

Table 22 - Slope angle of expressway embankment (soil batter)

2. The top of batter slope is filleted with the radius of  $R = 2.5\text{m}$ , the toe of fill batter  $R = 8.0\text{m}$ ; the top edge of cut shoulder  $R = 2.5\text{m}$ , the top of cut embankment  $R = 2H$  ( $H$  is the height of cut batter, measured in meter).

3. For the coordination between the shape of embankment and landscape, at the changing between cut section and fill section, batter slope of cut section should be gradually gentle from the middle of the section to the transition section (change to fill batter) (for example, the slope 1 : 2 in the middle is changed into 1 : 3 then 1 : 5).

Compaction and loading capacity requirements of pavement foundation

1. The compaction index of 30cm for the top layer under the pavement bottom layer must be  $K = 1.0$  (standard compaction of 22TCN 332) or improved compaction  $K=0.98$ . All the soil layers under the This requirement must be applied to fill embankment, earthwork-balanced embankment and cut embankment (if natural soil does not have the same compaction index as above).

2. The soil section of fill embankment underneath 30cm mentioned above must be compacted with  $K = 0.98$  (standard compaction) or improved compaction  $K = 0.95$ . The soil section of cut embankment underneath 30cm up to 1.0m depth must be compacted with  $K = 0.95$  (standard compaction).

3. The pavement of expressway must be designed to meet the pavement structure standard Grade I in Annex B of 22TCN 221, and correlatively meet the elastic module of  $400\text{daN/cm}^2$  or more.

4. The surface of cut batter on expressway must be reinforced by appropriate measures with the geotechnical and hydrological condition on site, to avoid the weathered condition creating soil, rock sliding and erosion in the batter.

Soil for expressway fill embankment shall be taken from borrow-pit. Do not take soil from excavation on the road sides because it cannot ensure the consistency, creating water inundation and destroying scenery. If

fine sand is used for filling, select cohesive soil with capability of avoiding erosion on surface, simultaneously select the method of filling that ensures the quality of compression, especially batter surface compression quality. The top layer of sand filling should be covered by 30 cm thickness of clayish sand or clay mixed with gravel with the compaction level stipulated in item 8.2.3.

Use the requirements in item 7.4 of TCVN 4054 to select the appropriate soil and request the compression level to be  $K=1.0$  for embankment behind bridge abutment, on both side of residential and drainage culverts.

Design requirements for expressway pavement on soft soil or peaty soil.

1. There must be the measures during the filling so that when reaching the design height and in use, the fill embankment ensure the stability of the entire embankment.
2. Before constructing the finished pavement structure, apply the measures to ensure the settlement of embankment meet the requirements of item 1.3.5 in 22TCN 211.
3. The size of fill embankment on soft soil must be designed correlatively with the value of settlement allowance and it should be noted that due to the large width of expressway, the settlement at centerline must be paid attention to avoid the inundated water.
4. For the fill embankment section on the soft soil at the end of bridge, culvert, underpass, to avoid the unpredicted damage of abutment base, wing wall, etc. by the negative friction between embankment and abutment when base is subsiding, the base must be designed with settlement reaching 90% of consolidation index before constructing foundations of above structures. If these requirements are not met, the foundation and their other parts must be designed with consideration of negative friction and forces from behind the abutment when the foundation keeps settling. Filling the embankment through these sections should be carried out as soon as possible to allow for pre-settlement. At the residential and drainage culverts with small opening, it is possible to have pre-surcharged over the culvert location; when the settlement reaches the consolidation level as required above, excavate to construct the foundation and culvert. The minimum time for surcharge is 6 month and the longer the better if the construction time is permitted. The construction of embankment on soft soil area shall be commenced as soon as possible and a good construction management is very important to avoid the deviation due to settlement at the expressway exit/entry to bridge and over the culvert.
5. For the general fill embankment sections of the expressway through soft soil areas and the section mentioned in Item 4 in particular, the settlement survey and lateral movement of the soil during the filling and waiting periods prior to the construction of road pavement is essential. It must be carried out in accordance with the appropriate survey quality to ensure the accuracy. The consolidation level of soft soil under fill loading (including the surcharge) can be evaluated through the settlement curve through actual survey if the survey result is trustable (it is possible to compare with the settlement forecasting result based on time)
6. If the expressway project has many soft soil sections, the owner shall hire the consultant and contractor to experiment some embankment section before constructing the embankment on the whole project. On the experiment embankment section, it is necessary to have sufficient equipment for settlement survey and lateral movement of the soil (at the top layers of soft soil and perhaps at different depth level in soft soil and survey equipment for porous water pressure at various depth in the soft soil). The observation time for this experimental embankment is at least 12-18 months. From the results of experiment filling, it is possible to confirm the treatment method or adjust the methods to suit the actual condition to have the most beneficial economical and technical results.

## Design of drainage system

Drainage system on expressway must drain water from road surface quickly to avoid infiltration of water to road structure and avoid the erosion of embankment at shoulder or batter. Due to the expressway has many lanes and median, the drainage design not only follow TCVN 4054 and item 2.6 of 22TCN 211 but also refer to item 15 “Surface water drainage planning for roads and height planning for drainage design” of TCXDVN104 (Urban Road - Design Specification).

In any case, at the expressway entry/exit section, curve section on plan and section with vertical slope less than 1%, in order to have good drainage system, the designer should have the height planning (vertical planning) in the entire width of road pavement.

In the low filling and cutting pavement, it is possible to use narrow side ditch of 0.50m with covers, or table drain of 0.4m-0.5m depth and 2m - 2.5m width, the batter slope and bottom of table drain is gently sloped or curved, and reinforced by thick grass.

On the curve section with one-way crossfall, design the water collection system next to the median by covered trench or pipeline and arrange the pipeline to convey water out of the pavement area; if using covered trench, it can encroach the safety lane and its cover can bear traffic loading capacity.

Locate the side trench in the grass shoulder on the top of fill batter and trench on the top of cut batter to hold and collect surface water, preventing water to cause damage to the batter. It is also possible to have a asphalt concrete barrier at the edge of the hard shoulder (the emergency lane) so that the hard shoulder can hold and collect water, preventing water from directly running to the batter but running to the flow opening then getting out of the pavement area. The distance between the flow stream and flow area must be determined based on the catchment area of each flow.

Every trench must be reinforced. The underground pipeline must be located on a reliable foundation to avoid water infiltration causing settlement and must be covered fully on top.

The drainage outfall from the pavement area or from the top trench, stopping trench to batter toe should have steps, flows and downstream reinforcement.

The calculated frequency of hydrology for the drainage trench is 4%, for bridge and culvert is 1%.

It is necessary to have a comprehensive treatment method for the underground water section and exposures of underground water that have the capability of causing negative impacts to the stability of the whole pavement.

## Pavement design

The expressway pavement must be designed with the structure of asphalt concrete or continuous steel-reinforced cement concrete or whole block cement concrete (cannot use assembled cement concrete) and ensure the requirements of intensity, durability, especially the roughness and smoothness index as mentioned in item 1.3.3 and 1.3.4 of 22TCN 211. For this purpose, the structural design and intensity calculation must follow the principles and guidance in current procedures of pavement design; in which for

the flexible pavement, it is necessary to study and design the rough-making layer suitable for the climate conditions and construction technique. Use the material with organic or inorganic binder for the subgrade of the asphalt concrete pavement. Use soil, rock, sand with inorganic binder for the cement road pavement.

The pavement structure of reinforced shoulders, central median cover layer, safety lanes, auxiliary lanes, toll gate of the expressway should comply with 22TCN 211.

At bridge abutment area, the expressway pavement should be located on strength transition slab to ensure good connection between road and bridge. The expansion joint is also chosen appropriately for smooth movement of vehicles from road to bridge.

### Designing and locating toll stations on expressway

The location of toll stations depends on the toll collection method:

- If applying "the close system", the toll gate must be located on all the exit/entry ramps and toll is collected according to the length of real journey on expressway (refer 7.3.2, 7.3.2 and Figure 7 of this standard).
- If applying "the open system", the toll gate is located at some certain locations on the expressway; toll is collected based on the acceptable average distance for every vehicle.
- If applying "the lump sum collection", the toll gate must be located at the ends of each expressway. Depending on the actual condition, the design consultant will select the toll collection method and study the location of toll gate, especially for "the open system" to avoid too many toll stations that may cause negative effects to the social activities (in particular with BOT project). The distance between toll gate of "the open system" is stipulated in the Circular "Guidance to the collection, management and using road tolls" No 90/204/TT-BTC dated Sept 07-2004.

The area of the toll gate requires the following works:

- The island of separating lane and classifying vehicles.
- Control booth, toll booth, ticket booth.
- Car parking for police work.
- Toll plaza (management, accounting, data storage, money box, transport control, electrical and communication system).

Alignment of the section having toll gate.

If toll gate is located on expressway, the alignment requirements of this section is the same as other sections on expressway. If it is on the branch road, the radius of the curve at that location must not be less than 200m.

Vertical grade in the area of toll gate should be less than 2.0%.

Crossfall at toll gate area is 2%.

The number of traffic lanes is defined in formula in 4.5.1; in which  $N_k$  is defined as shown in item 4.5.2 but the calculated duration is 10 years, then  $N_{tk}$  is defined as follows:

- For toll gate on entry ramp, no collection of money, only collect the number: from 500 units/hour-lane to 650 units/hour-lane.
- For toll gate on exit ramp, collection of money: from 300 units/hour-lane to 350 units/hour-lane.

It is necessary to rely on the traffic component forecast to define the number of lanes and required waiting length for every vehicle class with the same toll amount. Besides, one lane for over-sized vehicles should be located on the outer right-hand side on either side.

The number of traffic lanes at toll gate should be 1.5 - 2 times more than the number of traffic lanes on the expressway.

The width of one lane at toll gate is from 3.0m to 3.2m. The width of lanes for over-sized vehicle is from 3.5m to 4.0m.

The clearance in the area of one lane at toll gate is stipulated as figure 14.

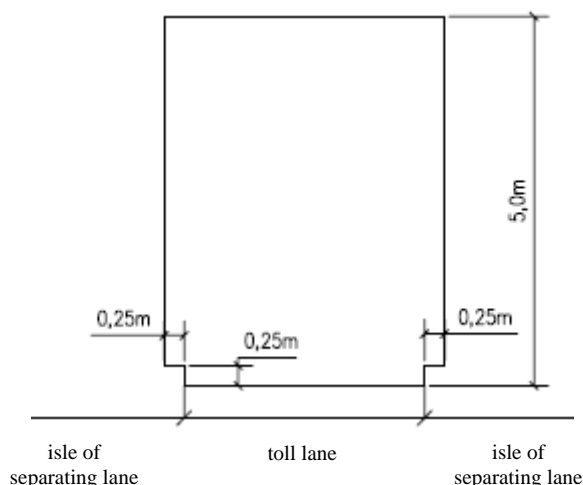


Figure 14 - the overhead space limit for one toll gate

The structure of lane-separating island at toll gate.

The width of island is from 1.50m to 2.20m (depending on the toll collection method); the surface of island is 0.25m higher than carriage-way (figure 14); the length of island along the road is from 25m to 30m if toll gate is located on branch road and from 30m to 45m if it is on freeway/expressway. On the island, outside the clearance limit in Figure 14, can arrange the toll booths. On the surface, two ends of toll gate island have one narrowed section as boat shape which is away from the island end with the length of 1/5 - 1/6 of island and it is filleted, increasing elevation and having line marking.

The roof of toll booth is 5 - 6m large every side from the center of toll booth and over the height of overhead space limit in figure 14.

Cross sections at the center of toll gate (this center is in the middle of toll island according the along the alignment).

These cross sections consist of toll lanes (the number of lanes is determined in accordance with 9.4), the lane-separating islands, the normal shoulder to the right side of the over-sized vehicle lane (do not arrange island for hard shoulder and over-sized lane). The total width of pavement at toll gate ( $B_{tr}$ ) is the total width of all mentioned elements.

The width transition from outside of toll stations area to the center of toll station.

The width  $B_{tr}$  determined in item 9.8 must remain the same in the area of the lane-separating island length and extend a minimum of 20m - 25m from each end of the land-separating island (if toll gate is on expressway) and 10m -15m (if toll gate is on the entry/exit ramp to expressway).

Outside of the above mentioned width ( $B_{tr}$ ), the width of pavement is gradually narrowed to the pavement width outside of the toll stations with the reduction factor of 1/3 (every 3m of the length, 1m of the width is reduced), symmetrical with road centerline. At the beginning point to reduce the width, arrange a curve connecting the edge of shoulder with the radius of 5m - 15m.

The length of toll station consists of the total length of constant width ( $B_{tr}$ ) and the length of reduced width sections (as mentioned in 9.9.2). This length should be audited to ensure the queue length on both ends of toll stations (the queuing length is recommended not longer than 500m).

In area defined in item 9.9.1 and 9.9.2, cement concrete road pavement must be (recommended to be constructed (preferably, continuous steel reinforced cement concrete pavement)

In front of each toll lane, the barrier must be placed to stop vehicles if necessary (except the lane for over-size vehicle). Around toll booth, protective balcony is required. The toll booth requires sufficient equipment for toll staff, installing communicative system and necessary devices for tolling purpose. For toll station with heavy traffic which have many gates and large traffic flows, use underpass for staff accessing the toll booths.

Safety measures, facilities and environmental protection on expressway

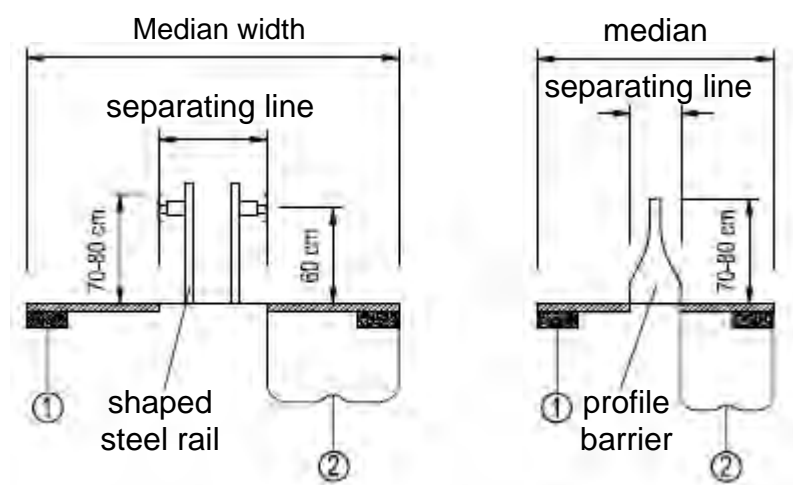
Safety measures, transport safety must follow the below stipulations:

On the median there must be two safety barriers (made of steel or cable) with back to each other (figure 15) or double protective barriers of shaped steel in these cases:

- The width of median is less than 4.50m.
- The width of median is from 4.5m to 10.0m but anticipated traffic after 5 years (from the time of opening traffic) will reach 4,000 unit/day/lane. If the width of median is over 10.0m, protective barrier is not needed.
- At the curve with the radius less than the normal smallest radius along the length of curve.
- On the right hand side and entire length of the signal pole or abutment foundation of the road crossing structure.



- At median break, the mobile barrier should be installed (can be opened for car turning back in emergency cases).



1) Widening section of 0.25m

2) The minimum distance to the edge of expressway pavement is at least equal to the width of safety lane (table 1)

Figure 15 - Protective balconies of shaped steel or barrier wall at the median

On the median there is a cover of 0.5÷0.75m width and barrier wall should be made of concrete (figure 15), the wall must be foot-buried or connected with steel pin with 20mm diameter to stick into cover layer.

On the grass shoulder, there must be a row of protective barriers of shaped steel or cable in these cases:

- Along the length of curve with the radius less than the normal smallest radius, excluding the case that this curve is on the low cut and fill embankment with the gentle batter slope and the table-drain having cover;
- The fill embankment height is more than 2.0m;
- The fill embankment height is over 1.0m without batter slope but replaced with retaining wall or abutment;
- In the area of signal panel pole or abutment for crossing bridge;
- Within 1.0m from the batter toe in the area river, pond;
- When using bridge, entry/exit the tunnel, overpass bridge at the grade-separated non-connected intersections;
- At entry/exit ramp of expressway, speed-changing lane, width-changing pavement sections.
- In the section that has railway or other highway running parallel with the expressway.

Install protective wall (concrete) along the length of high embankment section or sections having elevation higher than existing ground level over 5.0m. The structure of protective wall must follow 22TCN 237.

In cases of item 10.1.1 to 10.1.4, the edge side of balcony or protective wall should have at least the same width with safety lane (table 1), 1.0m from the pillar surface or the column of signal panels, 0.30m from the edge of road pavement, their height is 0.75m - 0.8m (the height of cable-stayed balcony is 1.05m).

In case using the hard protective wall with glaring resistance for median, the elevation above road surface is 1.2m and hence the safety lane must be a minimum of 1.0m.

Steel for barrier must be 4mm thick and galvanized, its section of cogwheel type (2 teeth) is 300mm - 350mm high. Shaped steel balcony is fixed to the supporting column through wedging block. The steel supporting column with the diameter of 110mm - 150mm or U shape steel of 100-125mm is buried of 70-120mm depth. The beginning sections of protective balcony must ensure the longitudinal anchoring capacity of the whole row by gradually lowering the beginning section to the ground level in the area of 12m long. The distance between the balcony columns is from 2m to 4m (or less on the curve section).

The cable-stayed barrier type requires cable diameter of 16÷20mm, connected to supporting column by 4-5 cables, the upper string is 10-25cm from the top of column, the lower string is 45cm above existing ground level. The structure of column, the distance among columns and the longitudinally anchoring method are the same as shaped steel balcony.

Install the barrier of steel net (or other materials) rigidly with a minimum height of 1.50m at the section where people or animals can suddenly cross the road. This barrier is placed at the edge and within the expressway ROW. The detailed specification and material requirements of these protective equipment should follow 22TCN 237.

### Direction-guidance design

Besides the line marking a direction guidance at the edge of road surface as mentioned in item 5.3.2, it is necessary to install some guide pole (to show direction at night or under rainy condition when direction-guidance line is hardly visible), coordinated with safety barriers and plants.

Guide post can be made of round, square, triangle section with the diameter or side of 12-15cm which placed on both sides of the road, 25cm away from the road shoulder, 1.05m higher than road shoulder and 35-40cm buried underground.

Guide post must be placed on the entire alignment (including ramps at interchanges), excluding the section with safety barriers and safety walls. The distance between guide posts depend on the horizontal curve radius (table 23).

Curve radius(m)	<30	30÷89	90÷179	180÷274	275÷374	375÷999	1000÷1999	≥2000 and on low embankment
Guide post distance(m)	4	8	12	16	20	30	40	50

Table 23 - Guide post distance (also applying to branch road)

On the curve section, there are at least 5 guide posts each side.

At the section with protective balconies, guide posts can be coordinated with supporting column at the same height (higher than balcony) or connecting one part of guide post on the top of supporting column,

In any case, guide post must be painted luminously (usually use yellow reflective paint of 4cm width, 18cm height at the body of guide post facing towards the traffic direction on black background by a distance of 25cm far from the top of column). The remaining column (both on top and bottom) is painted white.

Growing plants to show directions

Grow the high plants with straight trunk, straight and long root at median or in the area of safety corridor so that drivers can recognize direction from far distance (detailed design and verification by 3D image is required).

## Signals panels on expressway

Design of signal panels must aim for these purposes:

- Contributing to stipulations of vehicle class allowed to run (item 4.1) and transport regulations on expressway (see 4.2).
  - Provide information to road users regarding the related road network, journey (km, distance), travel directions at intersections, accident precautions, service system along the expressway.
- To fulfill the above requirements, it is necessary to repeat the information by combining the sign boards (both sign board on post and gantry) with the line marking, signs and writings on pavement. The combination must be consistent, and not conflict with each other.

The position, structure (material, size, font, color etc.) of signal panels, drawing lines (horizontal, vertical, font, signs) must follow stipulations in "Regulations of highway signal" 22TCN 237.

In any cases, signal works must not encroach safety lane including encroaching in vertical direction. If signage is placed on gantry, the overhead clearance is at least 5.2m.

The signal panels on expressway must be made of reflective glass or reflective materials.

For grade-separated connected interchange, signal panel is installed so that driver can see it before 10 seconds of reaching the intersection (the sign should show travelling directions of the interchange).

## Preventing glaring due to opposite headlight at night

If the express way has sufficiently wide median (with land preserve) so that the distance between two opposite traffic directions is more than 12m, anti-glaring measure is not required.

Anti-glaring measures must be arranged on the sections of heavy traffic (especially heavy truck) at night time; at the section with curve radius less than the normal radius value, vertical curve section, long straight section, mountain area with continuous level variations, long bridge, flyover without lighting, connected interchange, entry/exit to rest area and service areas on the expressway.

Anti-glaring method for opposite traffic direction headlights must be arranged on median of expressway or by growing shrubs or placing light-stopping panel of 1.60m height.

If choosing the shrub growing method, the shrubs should have green leaf all the year round. Each herb width is 0.4-0.6m and the distance between them is 2.0÷3.0m.

If using light-stopping panel, it consists of steel or general plastic plates of 1.5-4.0cm thick, 8.0-10.0cm width (at normal sections) or 8.0-25.0cm (at horizontal or vertical curve sections). The height of panel is 80.0cm. Each panel is mounted to the square shaped steel frame (section size is 40x40mm or 65x65mm) and connected to the top of straight-standing pole to directly bury at the middle of the median or at the top of cement concrete protective wall as mentioned in item 10.1.2 (the height from the top of this wall to median is 1.6m). In all cases, this panel is buried and anchored for 45° rotation to the traffic direction and located at every 50cm interval along the anti-glared section. The panel must be painted in dark color and securely buried to prevent the falling into the carriageway even during the storm event.

The sight-stopping distance must be checked at the curve section when using anti-glaring methods.

## Lighting on expressway

Lighting must be placed at the following sections:

- At toll gate area;
- In tunnel.

Besides, there should be lighting at:

- The area of connected intersection on expressway;
- The section where the vehicle just exit from expressway and approach one lit road section connected to the expressway or in the area of a lit zone (such as industrial zone, airport).
- On the right side of technical service center.
- At the important signal panels (when it is not possible to install signs with automatic lighting).

Light index which is measured by the average light on expressway pavement is from 1cd/m<sup>2</sup> to 2cd/m<sup>2</sup> (candela/m<sup>2</sup>).

The equally spread light level on carriage-way is shown by the luminous ratio between the darkest place and brightest place shall not be more than 1:1.3 along the alignment and 1:2.5 across the carriage-way.

The transition from the light section to the non-light section must be gradually carried out by decreasing the average illumination index from 2cd/m<sup>2</sup> to 0cd/m<sup>2</sup> in the minimum section area of 250m. If the section requiring light is less than 250m from each other, the light should be continuously kept at the section between them.

The light is placed on pole with the pole height of 12-15m and arranged in the line at the median or on the expressway shoulder or on both the median and the pavement (horizontally straight or staggered). The distance between the light poles must be computed in accordance with item 10.5.2 and 10.5.3.

## The service works on expressway

Along the expressway there should be the following service works:

- For every 50km - 60km, there should be a technical service center (capable of supplying petrol, oil, minor repair and facilities such as motel, restaurant, toilet).

- Every 120km to 200km there should a large service center (capable of repairing vehicles, supplying petrol, and receiving tourists with restaurants, hotels, tour information office, transit guide, etc.) based on the class of majority guests. It also requires a long-term parking area.

Coordinate with the towns along expressway to construct the service works. The entry/exit section to parking stations or service works must follow the requirements in item 7.8.

The parking stations along the expressway should be at the good scenery at different scope:

- Short-term parking: space for 1 - 3 units of vehicle with a relaxing hut and tourist map.
- Long term parking: space for many vehicles and perhaps with restaurant and telephone booths etc.

The service works must be located at the favorable place for entry/exit, must not block the sight distance at the steep and curve sections and far away from the intersections; the entry/exit must be more than 6m width and have the maximum speed of 40km/h.

These service works (especially petrol stations) should be located regularly and symmetrically (nearly opposite, it can see each other if not opposite) and have the same service capability.

The restaurants, hotels can be arranged on the same side but flyover/underpass must be constructed for passengers. Parking lots can be located on both sides of the expressway.

The scale of service stations must be based on traffic flow, traffic components, number of passengers for each service type at the station.

The emergency telephone booths (to urgently noticed to road management centre, traffic police, car repairing centre, emergency service...) should be installed along the expressway with the distance of 2-3km and at two ends of major structures (bridge, tunnel).

They are located on the grass shoulder, behind balconies or protective walls and symmetrically with each other on both sides of the road. Only 1 telephone booth at the median is not permitted. The phone booth must be painted for easy recognition and consistent in the entire expressway.

The design contents must consider the environment protection on both sides of the expressway in accordance with 22TCN 242, especially:

- Protective measures to agriculture, forestry, and water source.
- Improving the drainage condition, do not change the flood level on both sides of the expressway compared with the pre-construction condition
- Preventing noise, dust and wast by traffic activities.
- Method to resolve the traveling issues of residents on both sides of the expressway that require daily crossing of the expressway.

To protect agriculture, forestry, and water source, there must be measures of restoring excavated land for cultivation purpose; consideration of the effects of expressway operation and service works to surrounding water sources; restriction method of deforestation around the expressway and anti-erosive measures. For the large bridge, it is necessary to undertake comparison study for using approach bridge instead of high embankment to save cultivated land and avoid flow blocking.

The method of flooding prevention on the upstream end is basically to provide sufficient bridge navigation, drainage capacity and when necessary, lower the height of design road level as referred Clause 7.3.2 of standard TCVN 4054.

To improve environmental pollution by dust and sewer the following measures must be paid attention to:

- The main solution is to design the expressway without traffic congestion (the slower the vehicles run, the more dust and air pollution they emit), therefore calculation of traffic capacity must be considered properly (item 4.5); it is necessary to consider the design of uphill auxiliary lane near residential area and focus on traffic management measures.
- At the branch road to expressway, there should be the section to wash vehicles or the transitory section with the minimum length of 30m of the high grade pavement to restrict dirty vehicles entering the expressway.

The acceptable noise index for the residential area along the expressway is from 45 dB/A to 55 dB/A (A: the value of the maximum noise index measured at 2.0m from the wall, outside the house facing towards the expressway).

At the edge of expressway pavement, the noise index due to traffic is defined as follows:

$$L_0 = 24 + 20 \log N \quad (1)$$

of which:

- $L_0$  is the noise index, measured by dB
- $N$  is the traffic volume in one hour, measured by unit/hour.

The noise factor  $L_n$  is far from noise-causing position (centerline of expressway) with the horizontal distance,  $R_n$ , measured by meter, is defined by the formula:

$$L_n = L_0 - 25 \log \frac{R_n}{R_0} \quad (2)$$

of which:

- $L_0$  is the noise index at the edge of expressway pavement, measured by dB.
- $R_0$  is the distance from the centerline to the edge of expressway pavement, measured by meter.

After coordinating formula (1) and (2), we can anticipate the noise factor for the residential area  $R_n$ , measured by meter.

If the residential area is too close to the expressway and does not satisfy the noise requirements, the following anti-noise measures can be applied:

- Construct the noise-stopping wall of 3-3.5m tall, close to the edge of the expressway pavement (pavement widening), the wall is made of sound-stopping cement or assembly steel reinforced concrete slab
- Sound-stopping embankment with the top width of 2.0m, tall enough to create the sound-stopping area (from the center of carriage-way to the inner edge of the embankment top).
- Growing grove of plants outside the area of the expressway usage.

To ensure traveling of local residents on both sides of the expressway, the investment report preparation stage should suggest the service road options, underpass/flyover so that it is both favorable and economical. Besides, the designer must pay attention to planning, construction management for residential areas on both sides of the expressway.

The alignment location and technical standard of service roads must be determined based on actual traffic requirement at present and in future of 5-10 years (type of vehicles, traffic volume, etc.) predominantly for residential use. It is not obliged to design the road on any certain road grade (including the overpass width on the expressway). For the residential culvert under the expressway, there should be at least 1 traffic lane with 3.5m width (see 7.11.1).

To ensure the function of freeway/expressway, the service road must be completely separated from the expressway (if it is in the area of the expressway as mentioned in item 5.11, there must be barrier as shown in item 10.1.6).

The arrangement and construction of maintenance and service works for the expressway must be included in the expressway design project as other road routes and follow the regulations of Vietnam Road Authority (VRA).