

## Appendix-1

### Data Book for Road Slope Management

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# 1. RCD Risk on National Highway

## (1) Road Length with RCD Risk and Nos. of RCD

Region	Total Road Length from RBIA Data [km]	Road Length with RCD Risk [km]	Number of RCD in 2004														TOTAL	Number of RCD in 2005														Total
			SC: Soils Slope Collapse		RC: Rock Slope Collapse		LS: Landslide		RS: Road Slip		DF: Debris Flow		RE: River Erosion		CE: Coastal Erosion			SC: Soils Slope Collapse		RC: Rock Slope Collapse		LS: Landslide		RS: Road Slip		DF: Debris Flow		RE: River Erosion		CE: Coastal Erosion		
			Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured		Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	Full width	At least one lane is secured	
CAR	1,844	238	162	203	78	78	102	73	54	137	36	76	3	2	1	0	1005	172	192	72	76	118	67	47	117	30	61	3	1	1	0	957
NCR	1,014	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
Region I	1,609	82	0	19	5	9	0	0	0	0	0	1	0	6	1	0	41	1	19	5	9	0	0	0	0	1	1	0	4	0	1	41
Region II	1,753	208	10	39	2	2	66	16	9	40	19	24	9	9	0	0	248	9	26	0	2	13	24	6	23	7	17	3	11	0	0	141
Region III	1,989	260	234	15	1	0	15	4	9	40	16	42	3	29	0	0	408	13	3	0	0	0	2	0	1	5	13	0	25	0	0	62
Region IVA	2,404	116	4	6	2	0	10	11	4	16	0	0	2	2	3	1	61	1	12	1	2	2	6	0	30	0	4	0	4	0	1	63
Region IVB	2,172	157	18	40	5	24	12	81	6	67	0	35	1	21	17	31	358	13	33	3	31	9	72	4	56	0	20	1	21	12	19	294
Region V	2,196	30	4	17	2	5	3	20.5	2	13	0	11	13	0	0	2	93	4	19	2	3	3	22.5	2	13	0	12	14	0	0	2	97
Region VI	2,880	93	6	25	2	14	3	23	5	47	0	8	0	7	0	3	143	4	23	2	11	4	19	4	44	0	5	0	8	0	1	125
Region VII	1,960	114	0	20	0	13	8	36	1	28	0	15	0	11	0	22	154	0	17	1	15	8	31	1	23	0	19	2	14	0	21	152
Region VIII	2,332	88	4	20	2	4	5	11	1	21	2	2	2	6	1	0	81	6	12	1	4	4	16	2	24	2	3	5	9	1	1	90
Region IX	1,140	103	0	13	0	1	0	4	1	8	0	1	0	5	0	2	35	4	12	0	0	1	3	0	15	0	0	0	0	0	2	37
Region X	1,604	90	2	11	1	3	0	3	0	16	8	17	1	2	0	1	65	2	8	1	4	0	4	0	4	6	14	1	1	0	3	48
Region XI	1,446	102	2	4	1	3	6	13	2	6	3	6	0	1	0	4	51	2	6	1	3	14	13	16	43	6	7	0	1	0	4	116
Region XII	1,304	30	5	0	0	1	2	6	8	19	17	11	0	21	0	0	90	3	2	0	1	0	7	9	18	16	6	0	20	0	3	85
Region XIII	1,357	59	6	13	0	4	2	13	9	38	21	11	1	21	0	0	139	4	10	0	2	1	12	10	45	20	6	0	23	0	4	137
GRAND TOTAL	29,005	1,774	457	445	101	161	234	315	111	496	122	260	35	143	23	66	2,969	238	394	89	163	177	299	101	457	93	188	29	143	14	62	2,447

**(2) Actual Intensity of RCD**

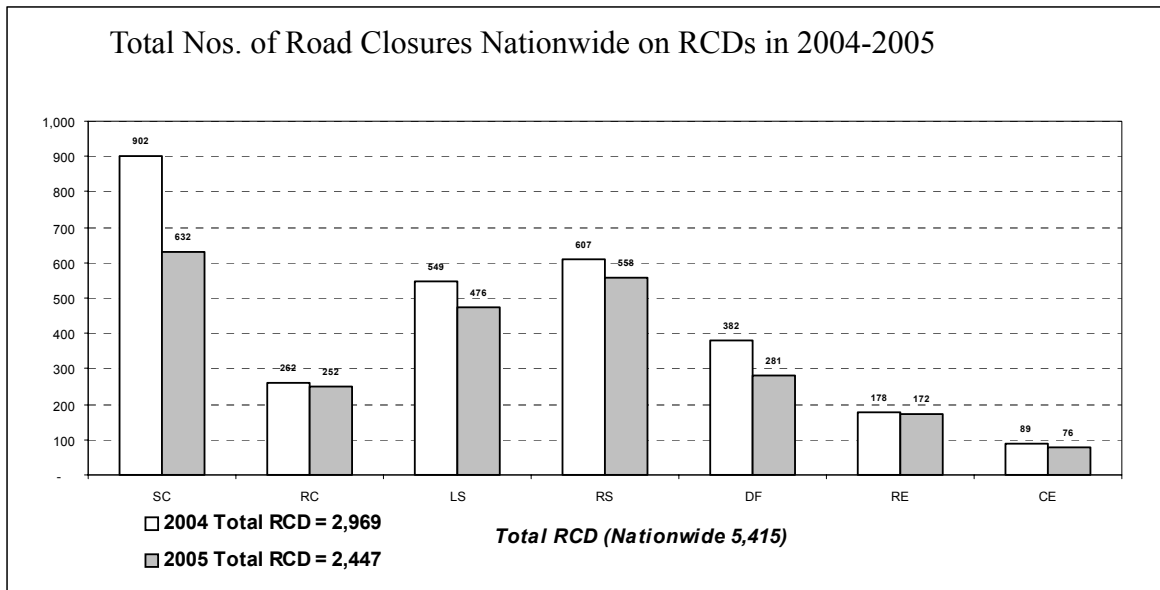
Region	Road Length with RCD Risk [km]	Annual Nos. of RCD (2004 & 2005)															Annual Nos. of RCD [Nos. of RCD per Year]			Actual Intensity of RCD [Nos. of RCD per (km* year)]			
		RLwRCD	2004 RCD							2005 RCD							ANRCD			ANRCD/RLwRCD			
			SC	RC	LS	RS	DF	RE	CE	SC	RC	LS	RS	DF	RE	CE	2004	2005	Average	2004	2005	Average	
CAR	238	365	156	175	191	112	5	1	364	148	185	164	91	4	1	1005	957	981	4.23	4.03	4.13		
NCR	5	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	0.00	0.40	0.20		
Region I	82	19	14	0	0	1	6	1	20	14	0	0	2	4	1	41	41	41	0.50	0.50	0.50		
Region II	208	49	4	82	49	43	18	0	35	2	37	29	24	14	0	245	141	193	1.18	0.68	0.93		
Region III	260	249	1	19	49	58	32	0	16	0	2	1	18	25	0	408	62	235	1.57	0.24	0.90		
Region IVA	116	10	2	21	20	0	4	4	13	3	8	30	4	4	1	61	63	62	0.53	0.54	0.53		
Region IVB	157	58	29	93	73	35	22	48	46	34	81	60	20	22	31	358	294	326	2.29	1.88	2.08		
Region V	30	21	7	23.5	15	11	13	2	23	5	25.5	15	12	14	2	92.5	96.5	95	3.13	3.26	3.19		
Region VI	93	31	16	26	52	8	7	3	27	13	23	48	5	8	1	143	125	134	1.55	1.35	1.45		
Region VII	114	20	13	44	29	15	11	22	17	16	39	24	19	16	21	154	152	153	1.35	1.33	1.34		
Region VIII	88	24	6	16	22	4	8	1	18	5	20	26	5	14	2	81	90	86	0.92	1.02	0.97		
Region IX	103	13	1	4	9	1	5	2	16	0	4	15	0	0	2	35	37	36	0.34	0.36	0.35		
Region X	90	13	4	3	16	25	3	1	10	5	4	4	20	2	3	65	48	57	0.72	0.53	0.63		
Region XI	102	6	4	19	8	9	1	4	8	4	27	59	13	1	4	51	116	84	0.50	1.14	0.82		
Region XII	30	5	1	8	27	28	21	0	5	1	7	27	22	20	3	90	85	88	3.00	2.83	2.92		
Region XIII	59	19	4	15	47	32	22	0	14	2	13	55	26	23	4	139	137	138	2.34	2.31	2.33		
<b>TOTAL</b>	1,774	902	262	549	607	382	178	89	632	252	476	558	281	172	76	2,969	2,447	2,708					
																		Average			1.51	1.40	1.45

(3) Annual Loss

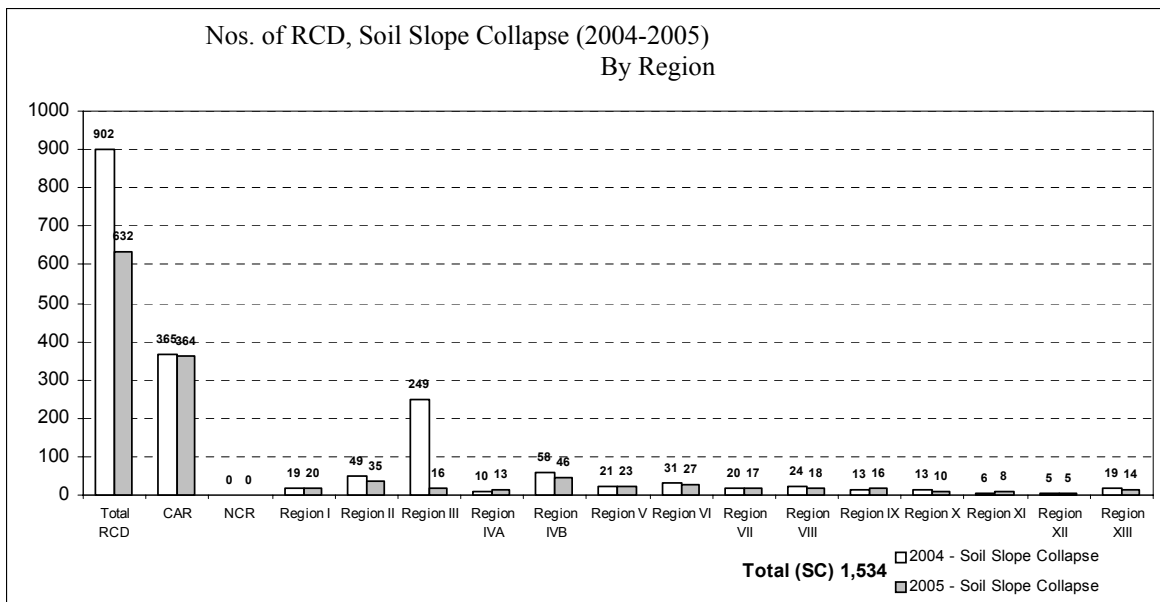
Region	Annual Nos. of RCD [Nos. of RCD per Year]									Annual Loss [million pesos]			
	2004			2005			Average			Reopening Cost	Human Lives Lost	Detour Cost	Total
	Full Width	At Least One Lane is Secured	Total	Full Width	At Least One Lane is Secured	Total	Full Width	At Least One Lane is Secured	Total				
CAR	436	569	1005	443	514	957	440	542	981	405	7	759	1,171
NCR	0	0	0	0	2	2	0	1	1	0	0	0	0
Region I	6	35	41	7	34	41	7	35	41	14	0	11	25
Region II	115	130	245	38	103	141	77	117	193	77	1	132	210
Region III	278	130	408	18	44	62	148	87	235	109	2	256	367
Region IVA	25	36	61	4	59	63	15	48	62	22	0	25	47
Region IVB	59	299	358	42	252	294	51	276	326	107	2	87	197
Region V	24	68.5	92.5	25	71.5	96.5	25	70	95	34	1	42	77
Region VI	16	127	143	14	111	125	15	119	134	43	1	26	69
Region VII	9	145	154	12	140	152	11	143	153	47	1	18	66
Region VIII	17	64	81	21	69	90	19	67	86	30	1	33	63
Region IX	1	34	35	5	32	37	3	33	36	11	0	5	17
Region X	12	53	65	10	38	48	11	46	57	19	0	19	39
Region XI	14	37	51	39	77	116	27	57	84	31	1	46	78
Region XII	32	58	90	28	57	85	30	58	88	34	1	52	86
Region XIII	39	100	139	35	102	137	37	101	138	50	1	64	115
<b>GRAND TOTAL</b>	1,083	1,886	2,969	741	1,706	2,447	912	1,796	2,708	1,033	19	1,575	2,627

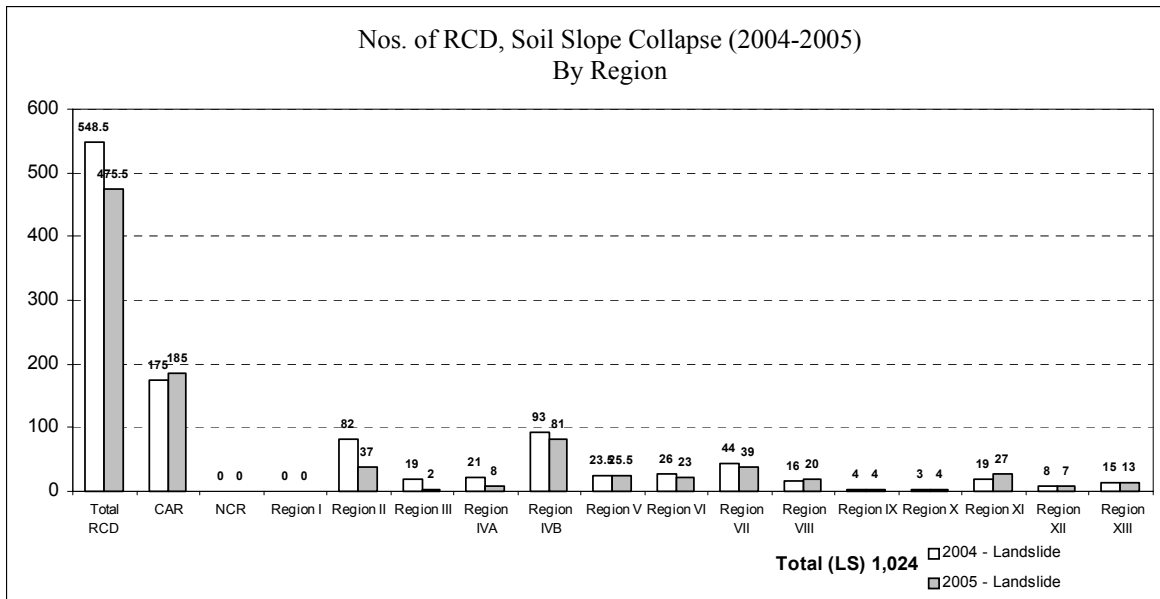
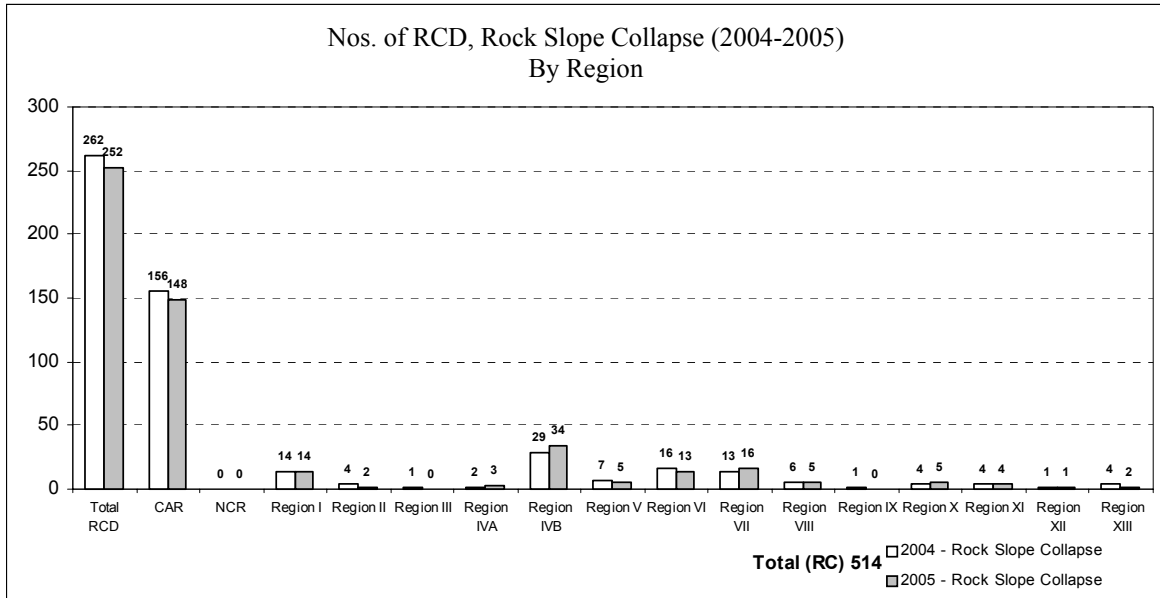
Units from Questionear Survey		
Unit Reopening Cost of Road Closure (Full Width)	pesos	570,872
Unit Reopening Cost of Road Closure (At least one Lane is Secured )	pesos	285,436
Average Number of Human Death per RCD	pesos	0.003
Unit Value of Human Lives Lost	pesos	2,300,000
Average Nos. of Days of Full Width Road Closure per RCD	days	2.3
Average Detour Cost per day	pesos	750,823

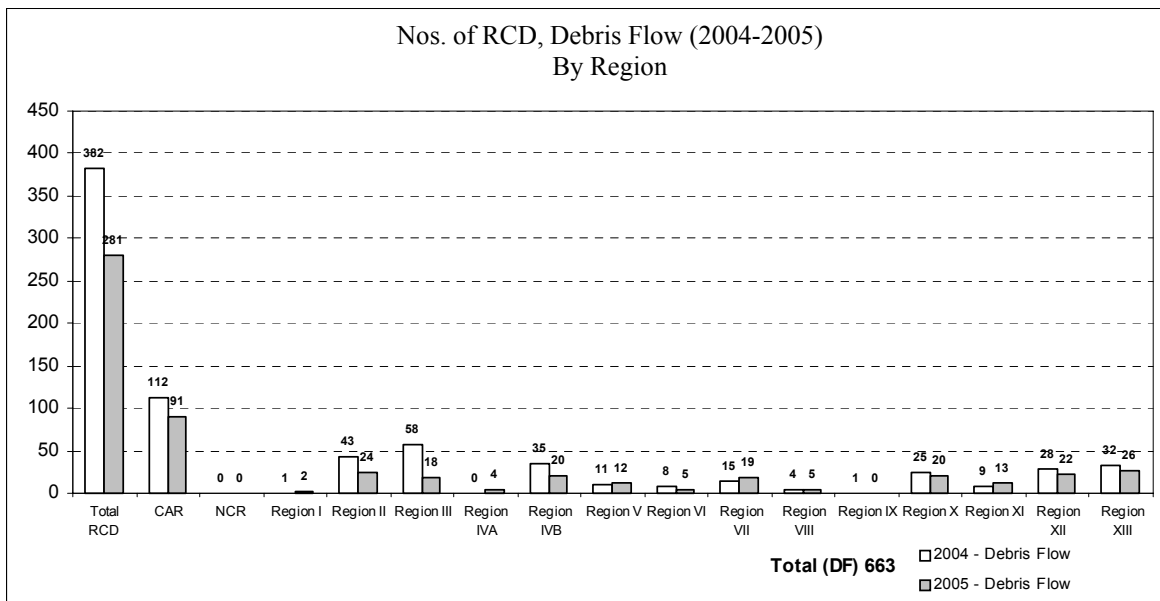
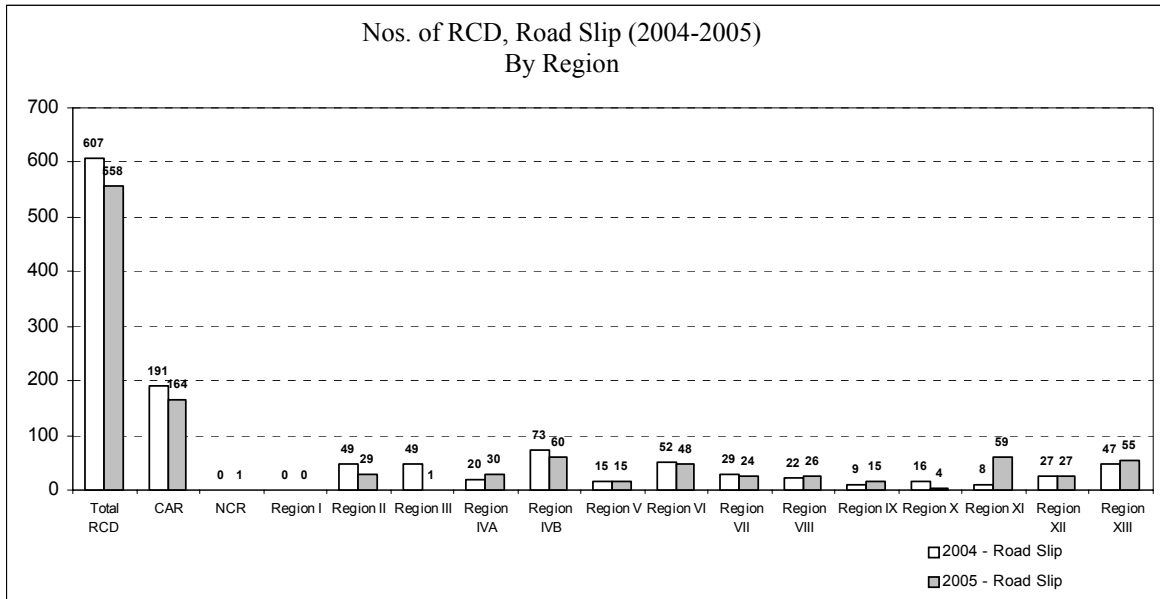
(4) Histograms for Nos. of RCDs

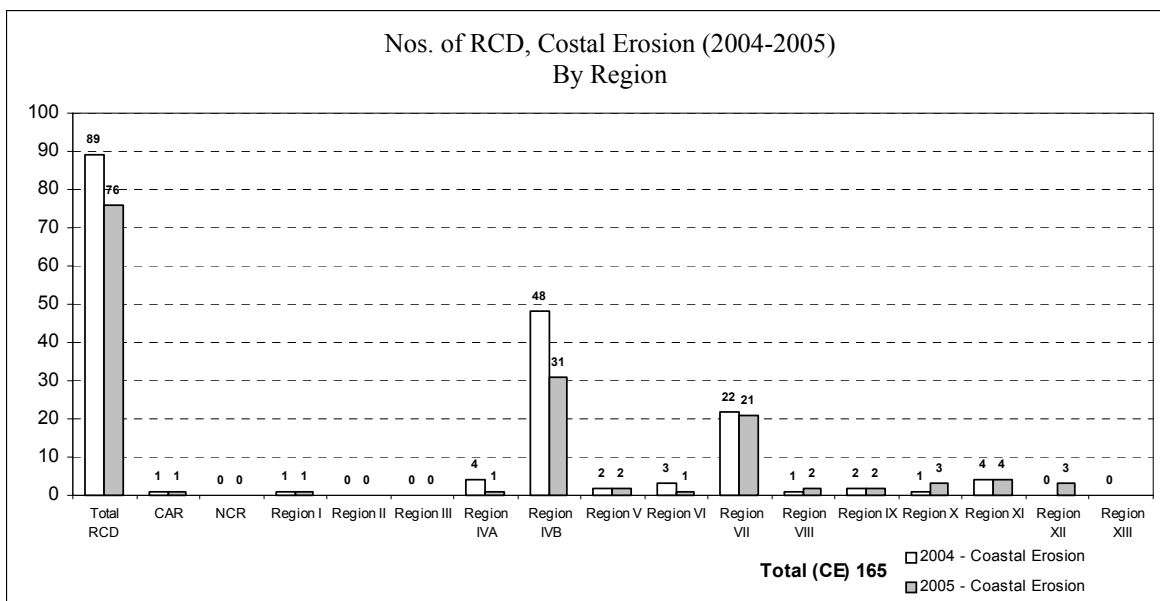
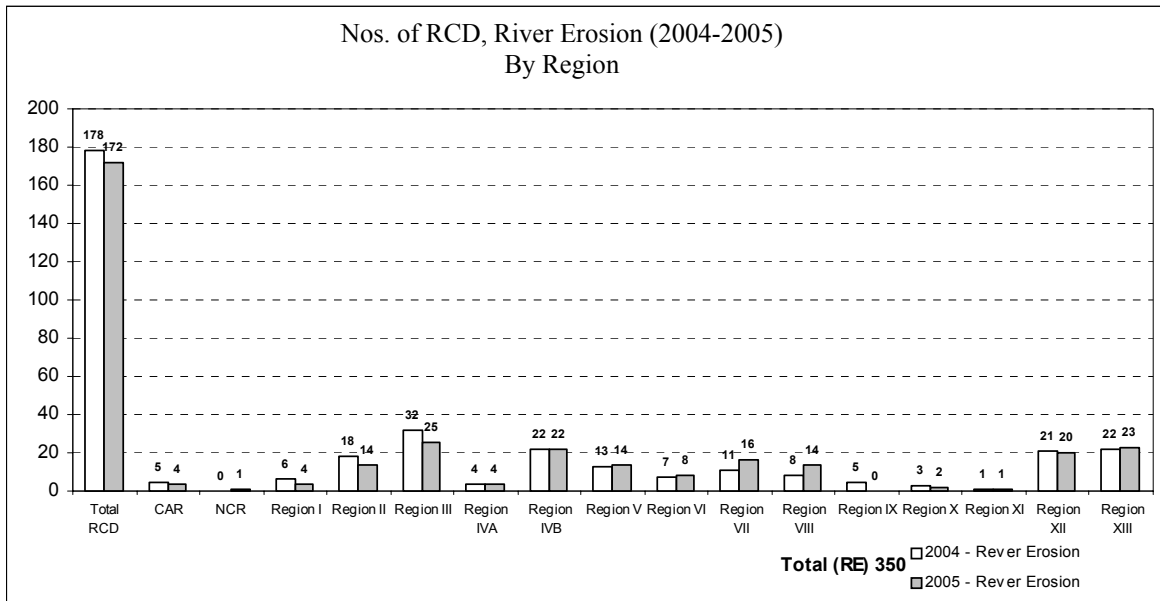


SC: Soil Slope Collapse, RC: Rock Slope Collapse, LS: Landslide, DF: Debris Flow, RE: River Erosion, CE: Costal Erosion

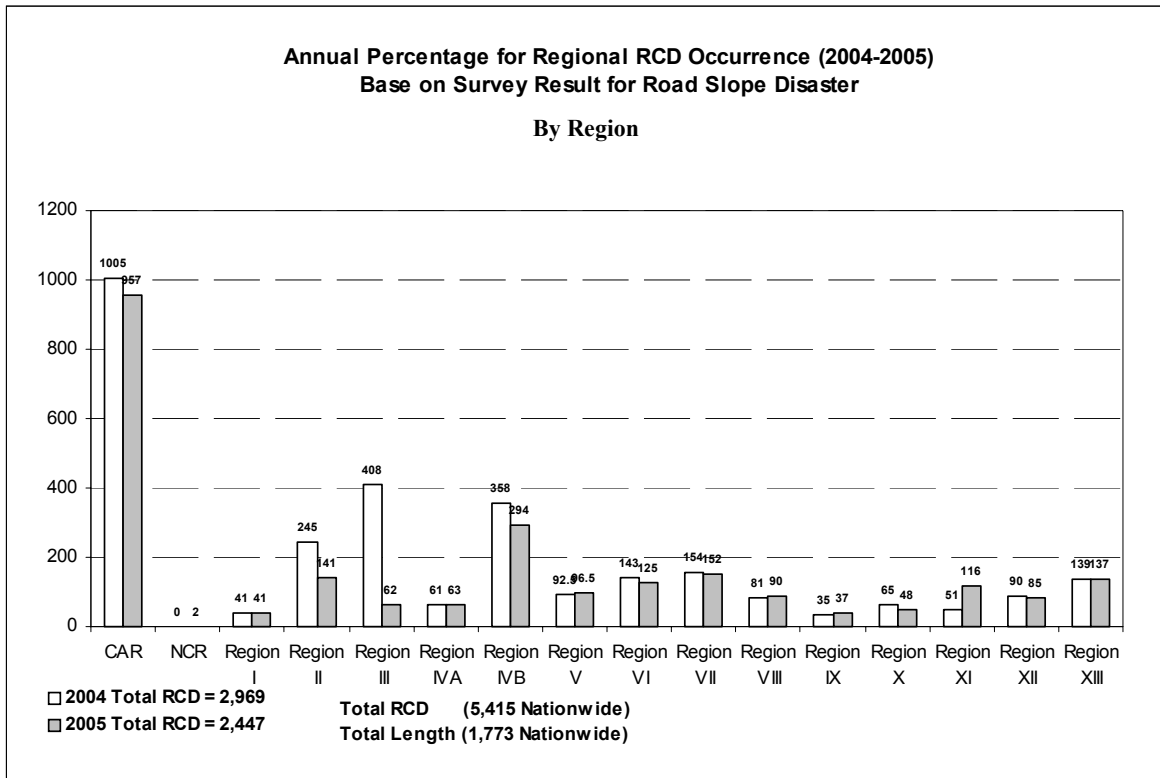


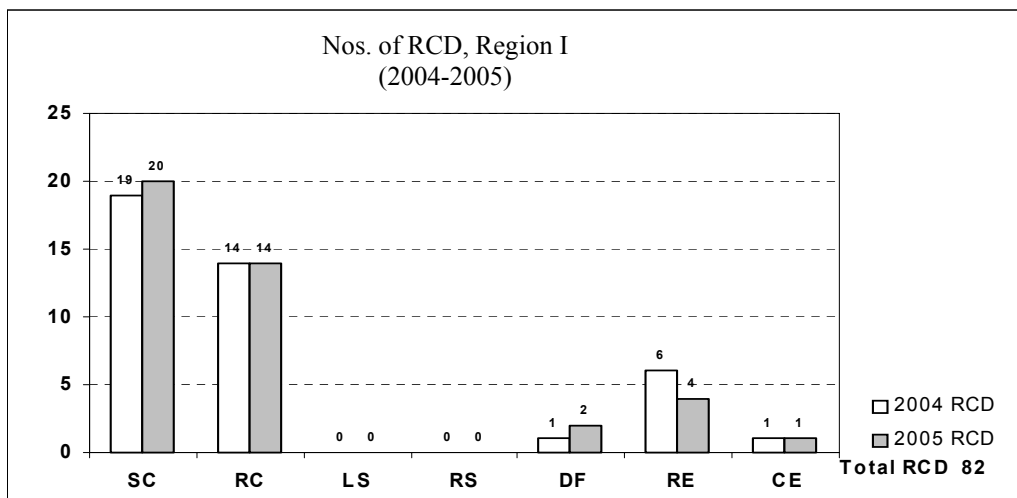
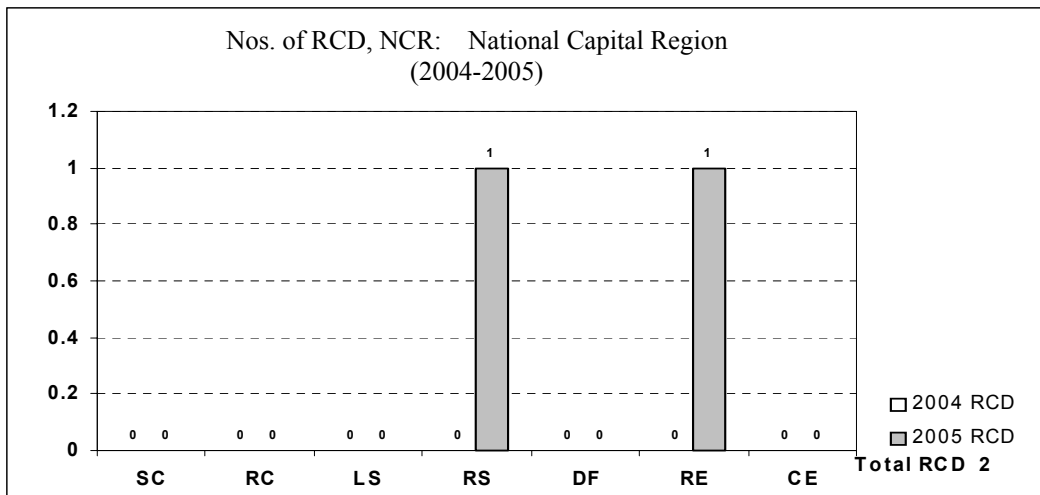
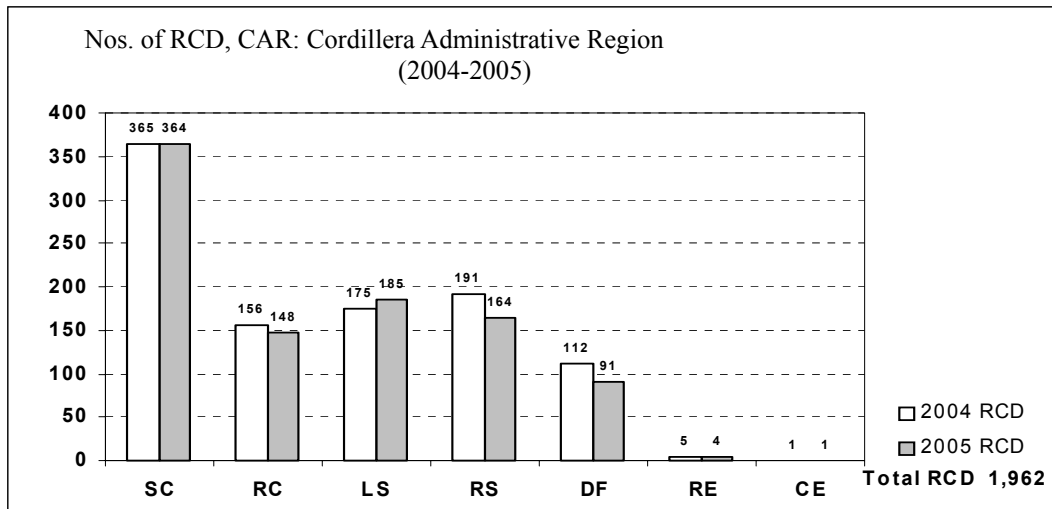




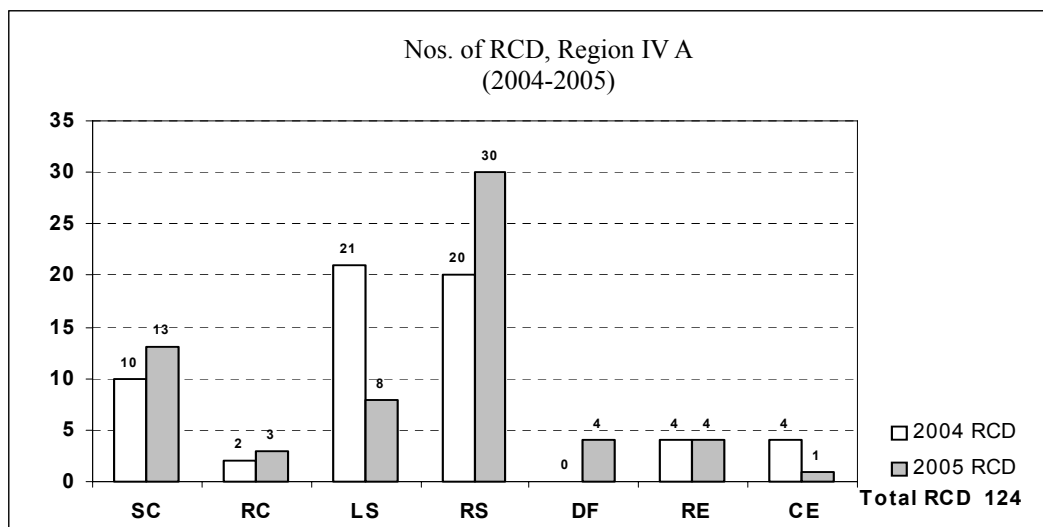
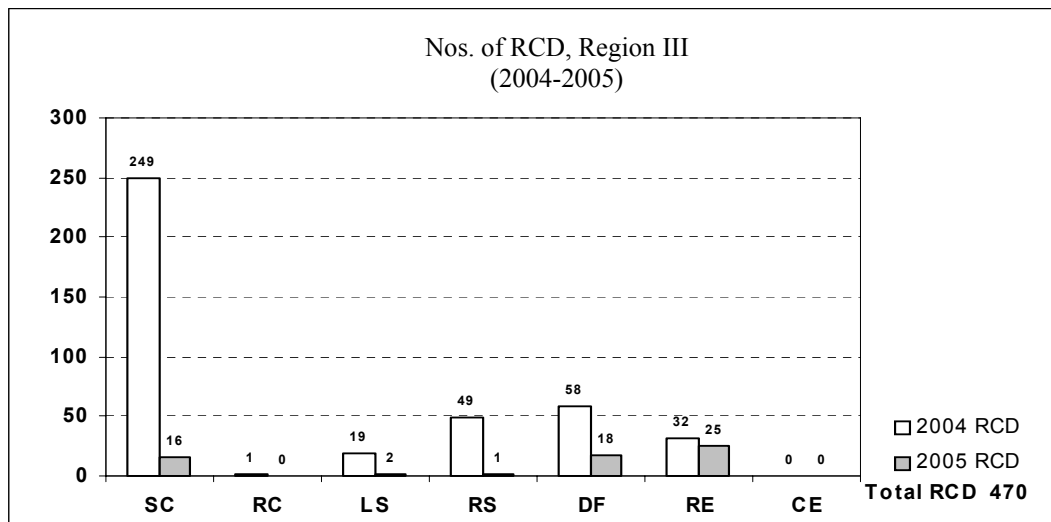
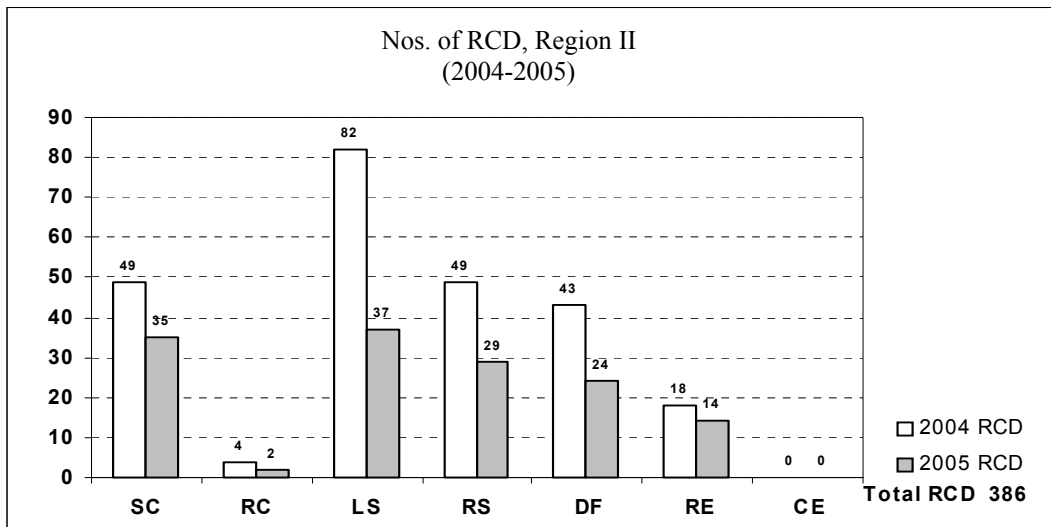




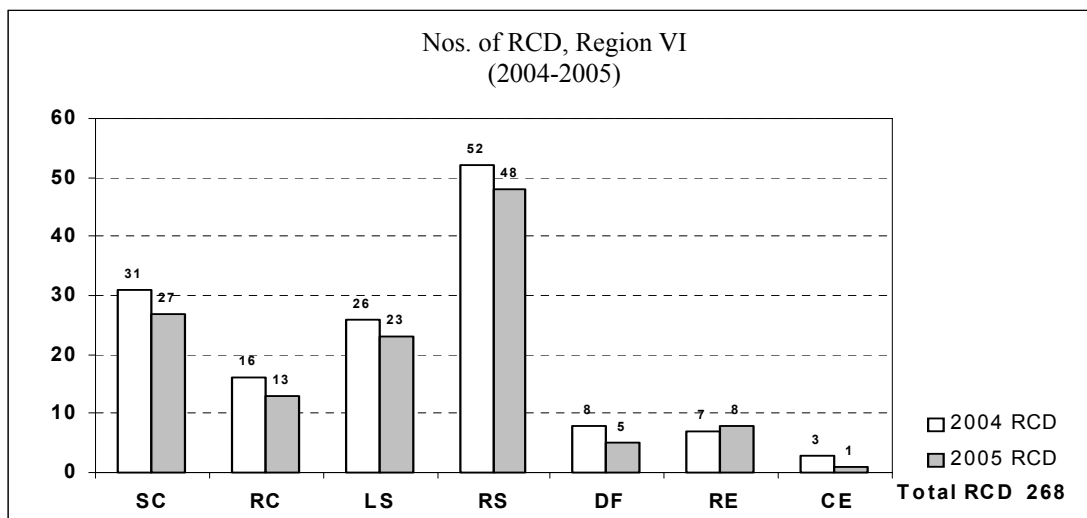
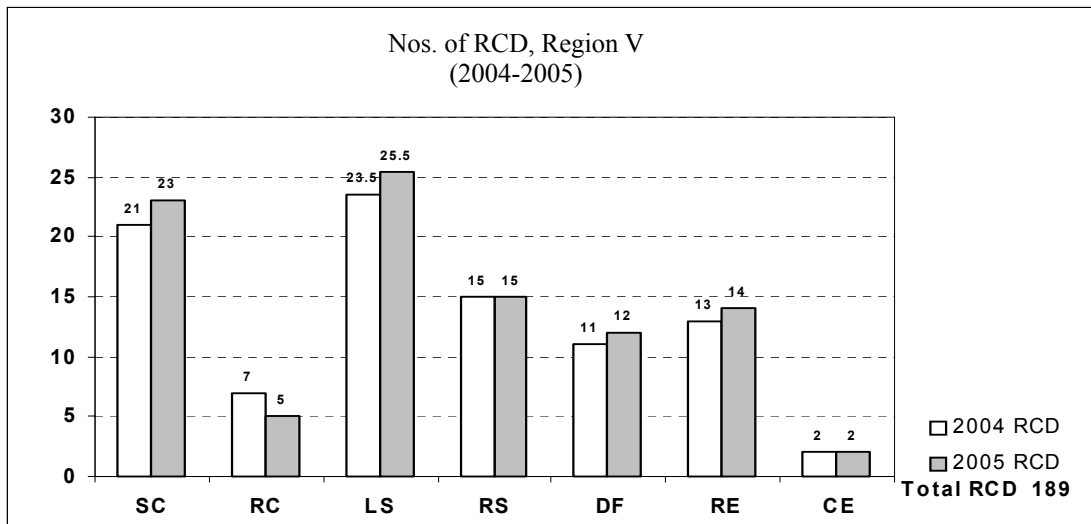
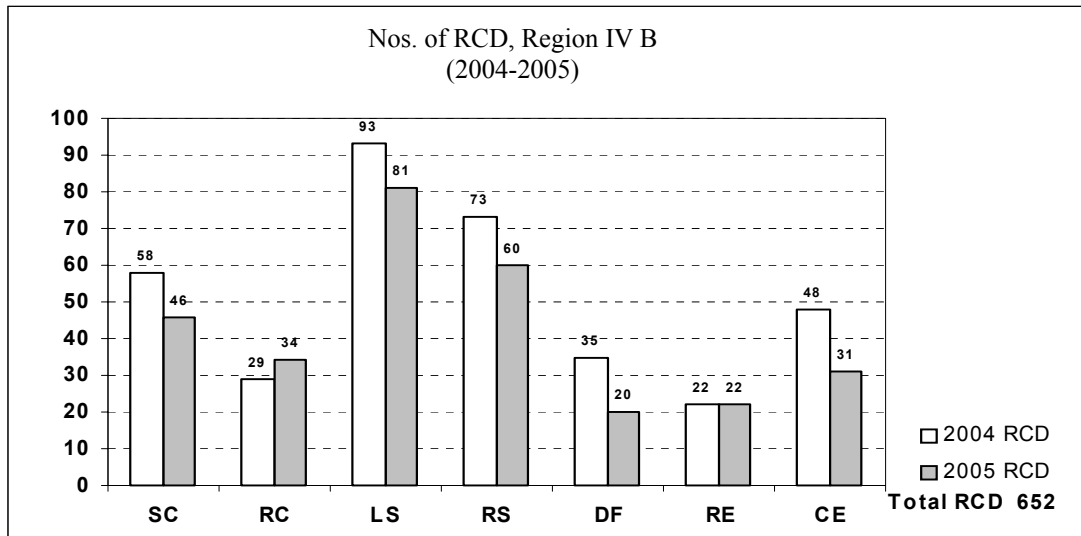




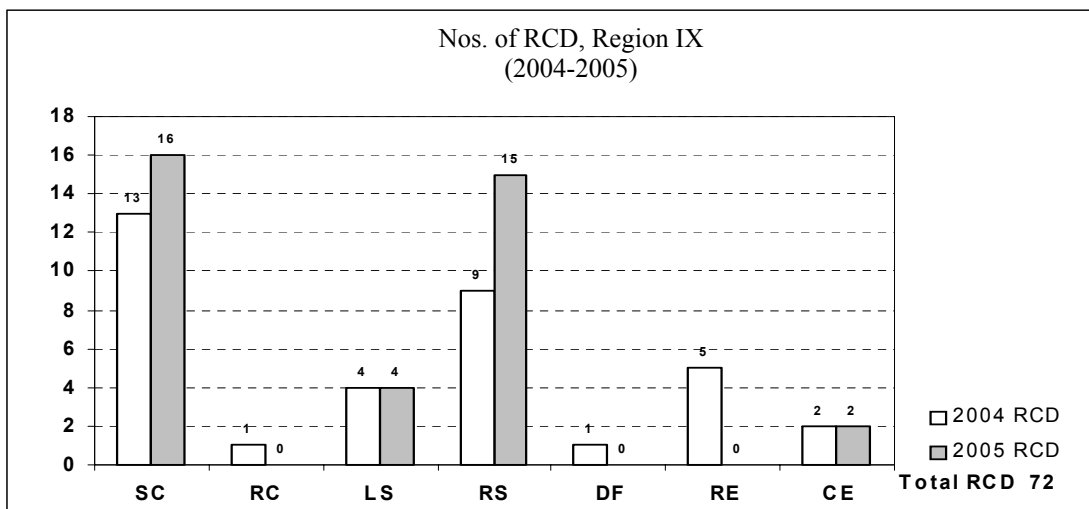
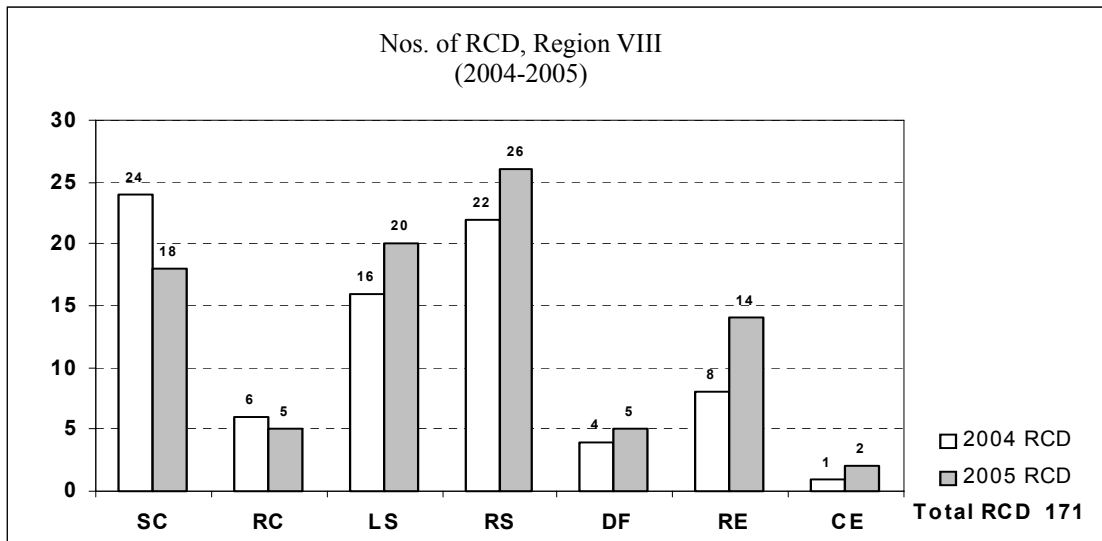
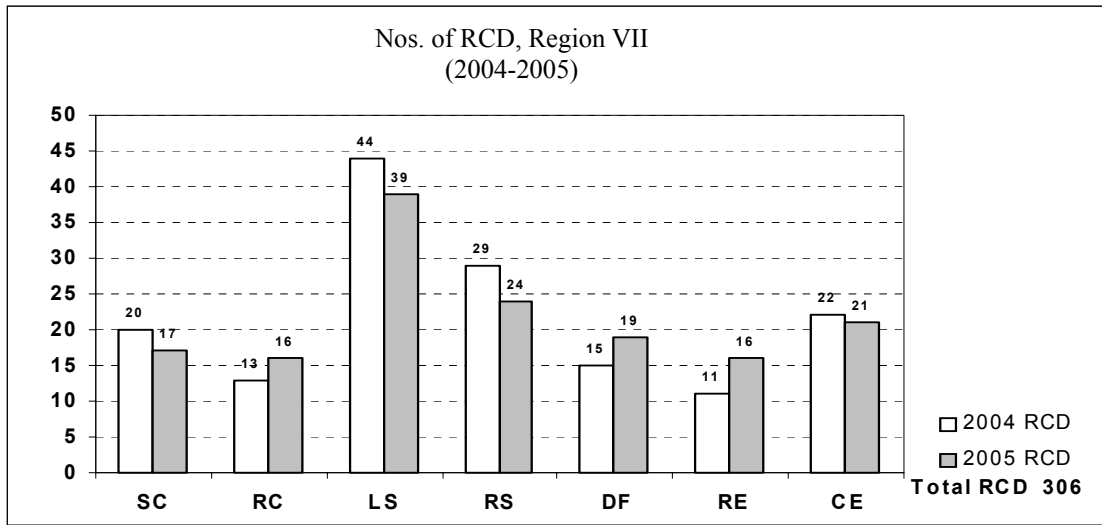
SC: Soil Slope Collapse, RC: Rock Slope Collapse, LS: Landslide, DF: Debris Flow, RE: River Erosion, CE: Coastal Erosion



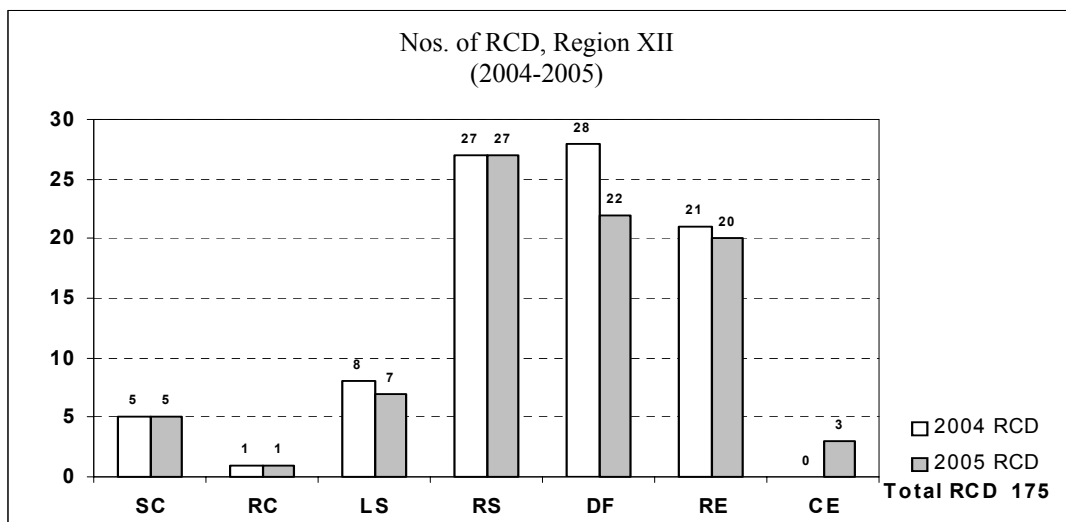
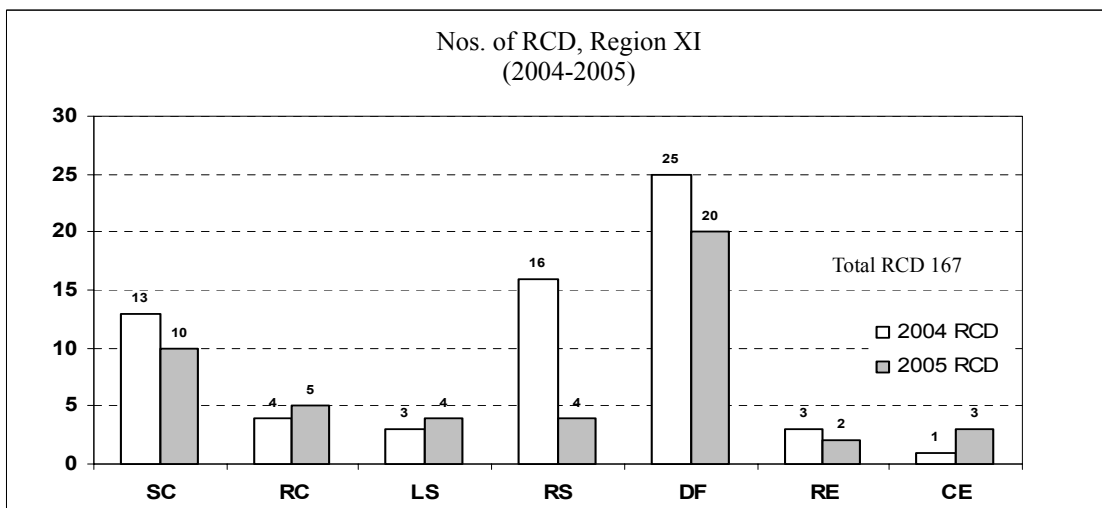
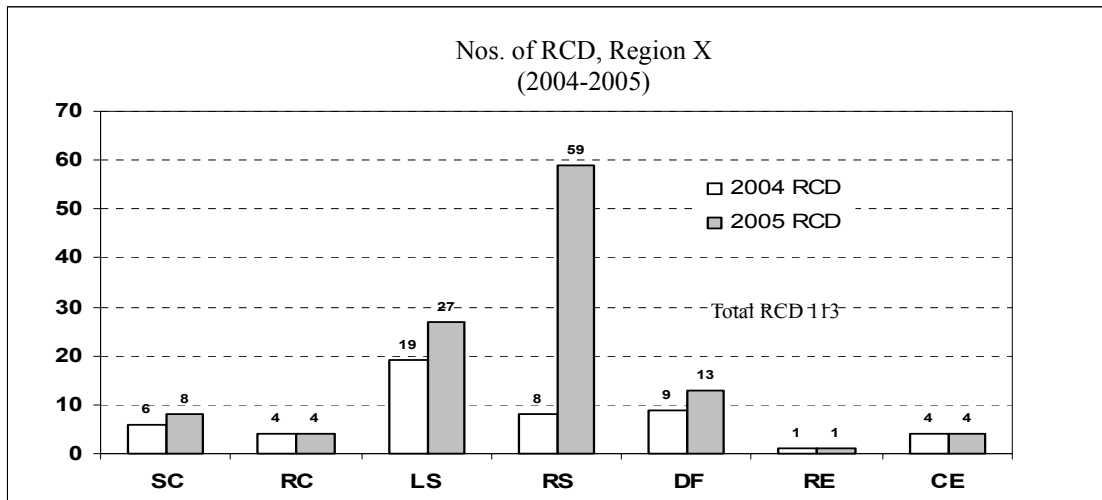
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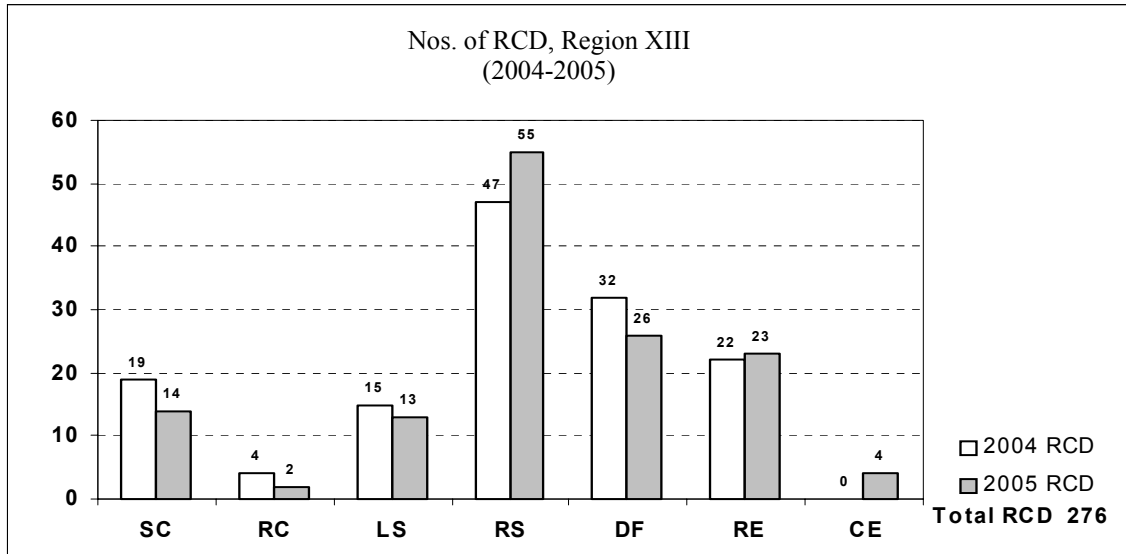
SC: Soil Slope Collapse, RC: Rock Slope Collapse, LS: Landslide, DF: Debris Flow, RE: River Erosion, CE: Coastal Erosion



SC: Soil Slope Collapse, RC: Rock Slope Collapse, LS: Landslide, DF: Debris Flow, RE: River Erosion, CE: Coastal Erosion



SC: Soil Slope Collapse, RC: Rock Slope Collapse, LS: Landslide, DF: Debris Flow, RE: River Erosion, CE: Coastal Erosion



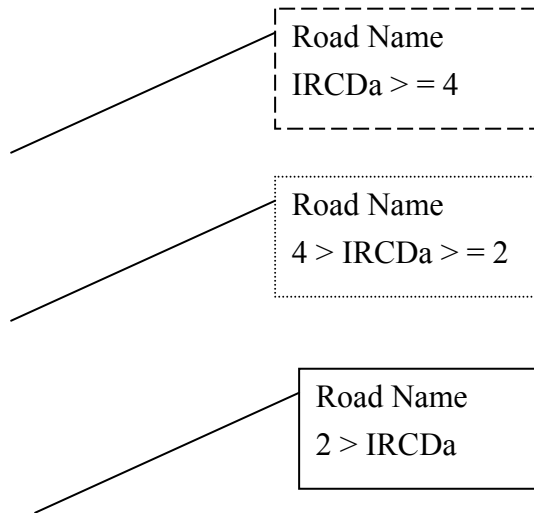
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## 2. Road Sections with RCD Risk

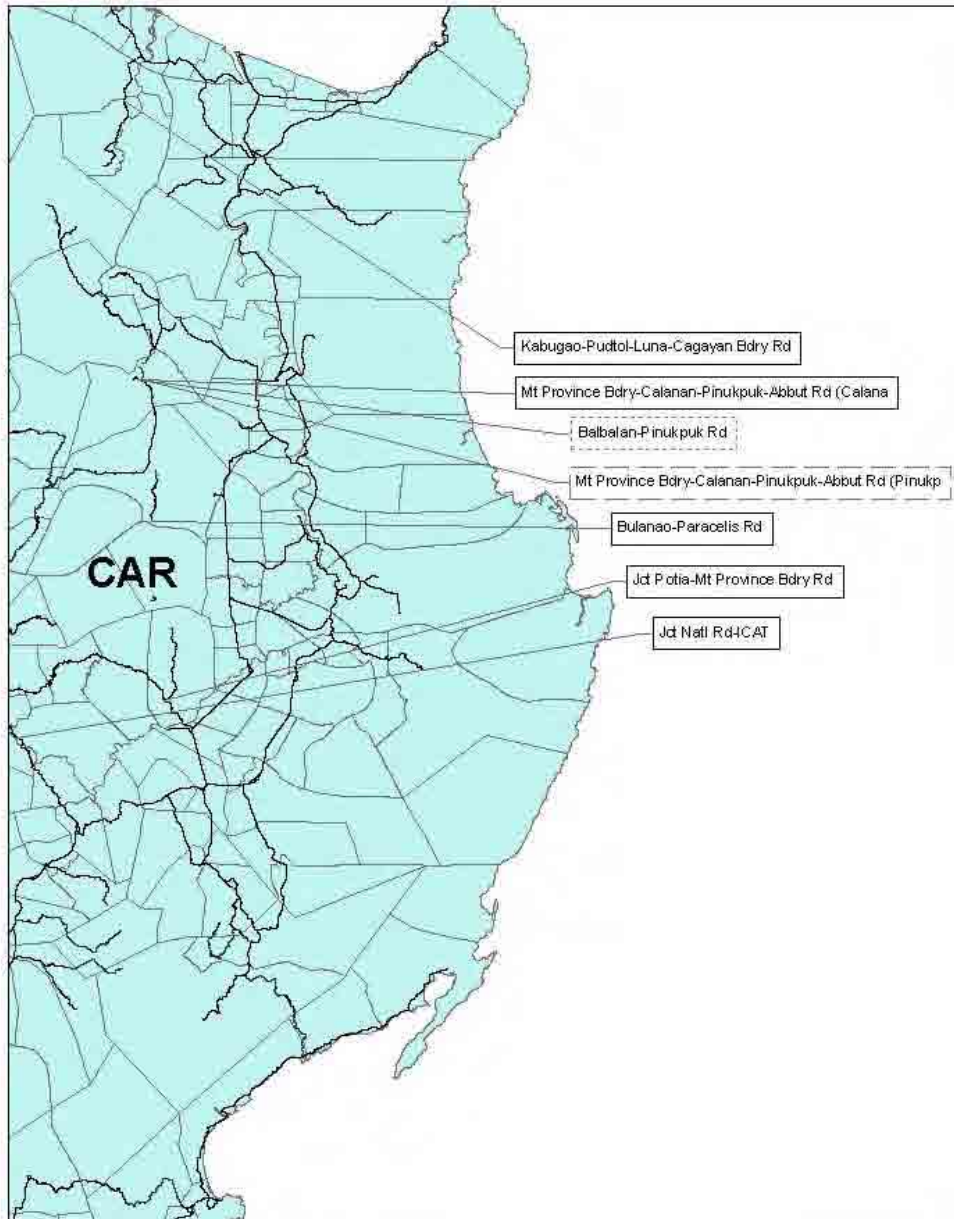
### (1) Map

Road Sections with RCD Risk are shown in maps with IRCDA Level from the subsequent page.

Actual Intensity of Road Closure Disaster (IRCDA) [Nos. of RCD per (year\*km)]







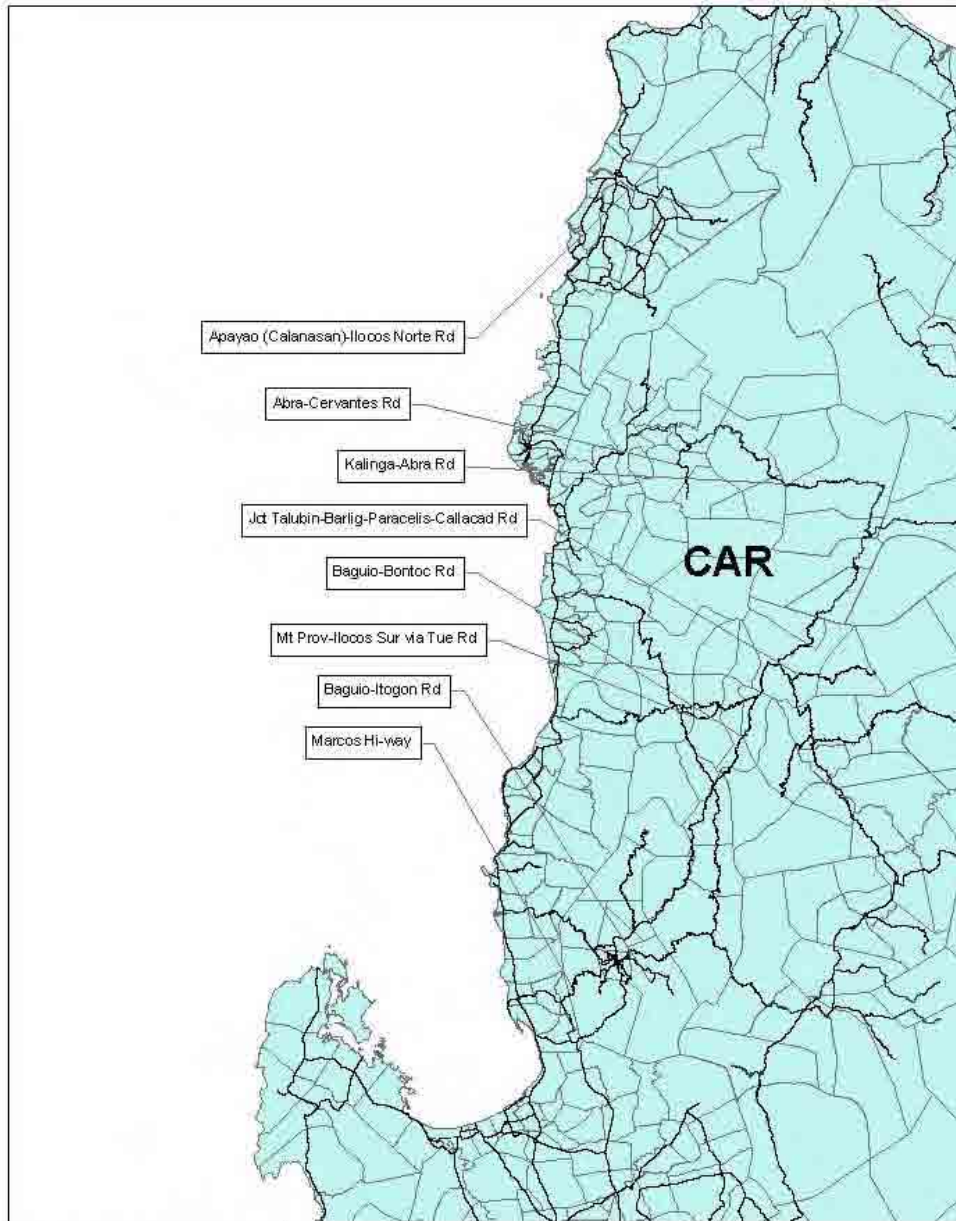
**Location of Road Section with Actual RCD Risk**

**CAR: Cordillera Administrative Region (1/2)**

Road Name  
IRCDa >= 4

Road Name  
4 > IRCDa >= 2

Road Name  
2 > IRCDa



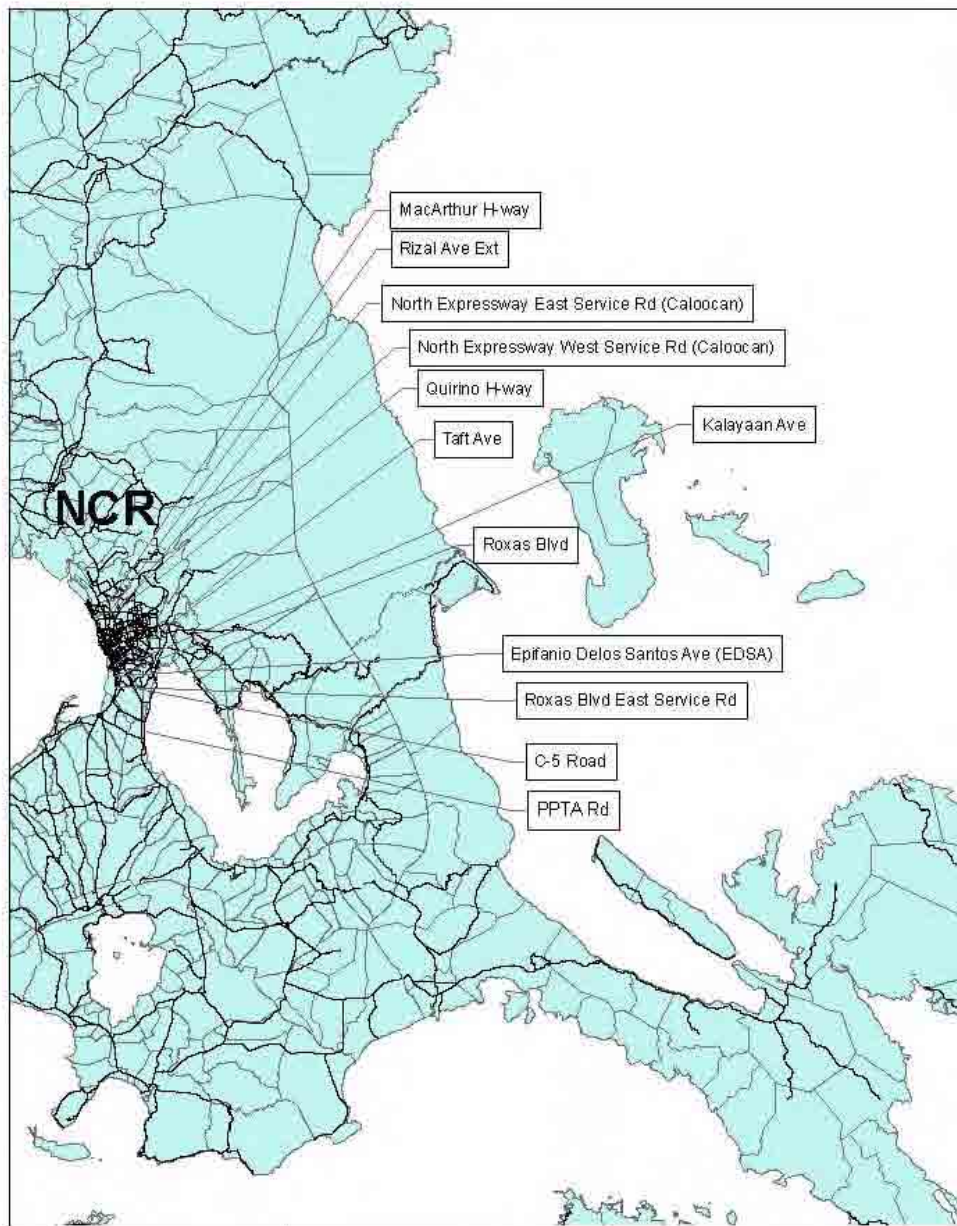
**Location of Road Section  
with Actual RCD Risk**

**CAR: Cordillera  
Administrative Region (2/2)**

Road Name  
IRCDa  $\geq 4$

Road Name  
 $4 > \text{IRCDa} \geq 2$

Road Name  
 $2 > \text{IRCDa}$



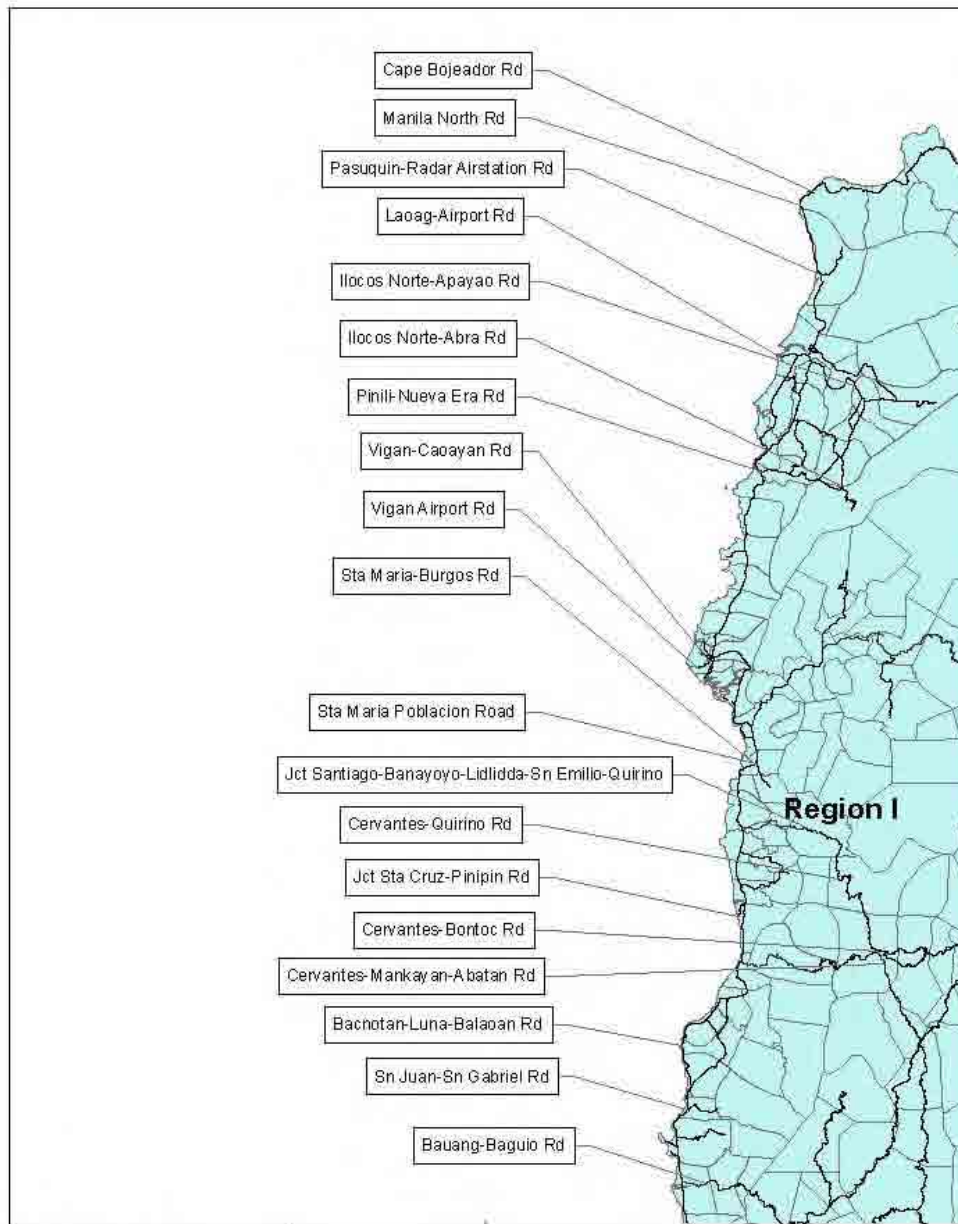
**Location of Road Section with Actual RCD Risk**

**NCR: National Capital Region**

Road Name  
IRCDa  $\geq$  4

Road Name  
 $4 >$  IRCDa  $\geq$  2

Road Name  
 $2 >$  IRCDa



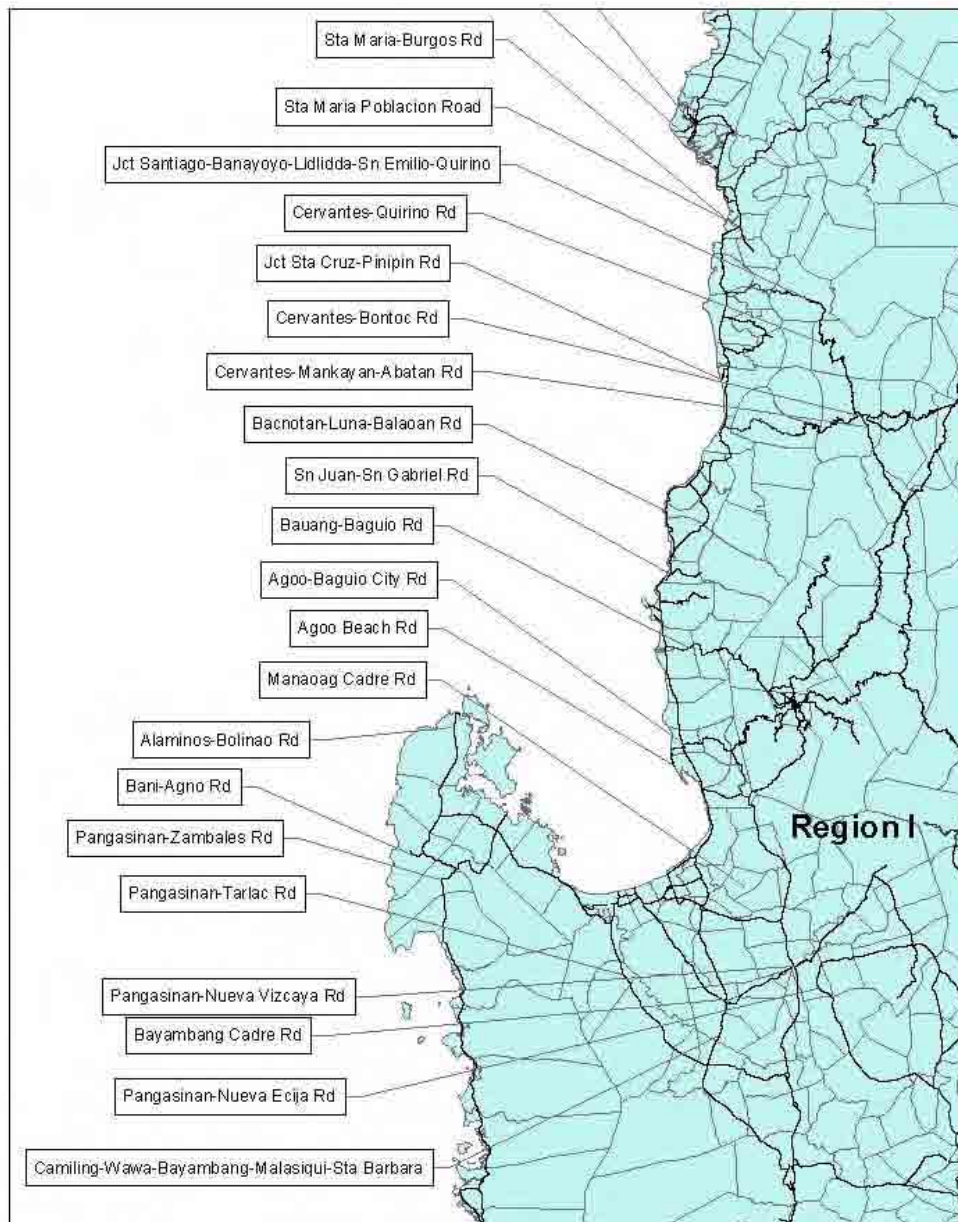
**Location of Road Section with Actual RCD Risk**

Road Name  
IRCDa >= 4

**Region I (1/2)**

Road Name  
4 > IRCDa >= 2

Road Name  
2 > IRCDa



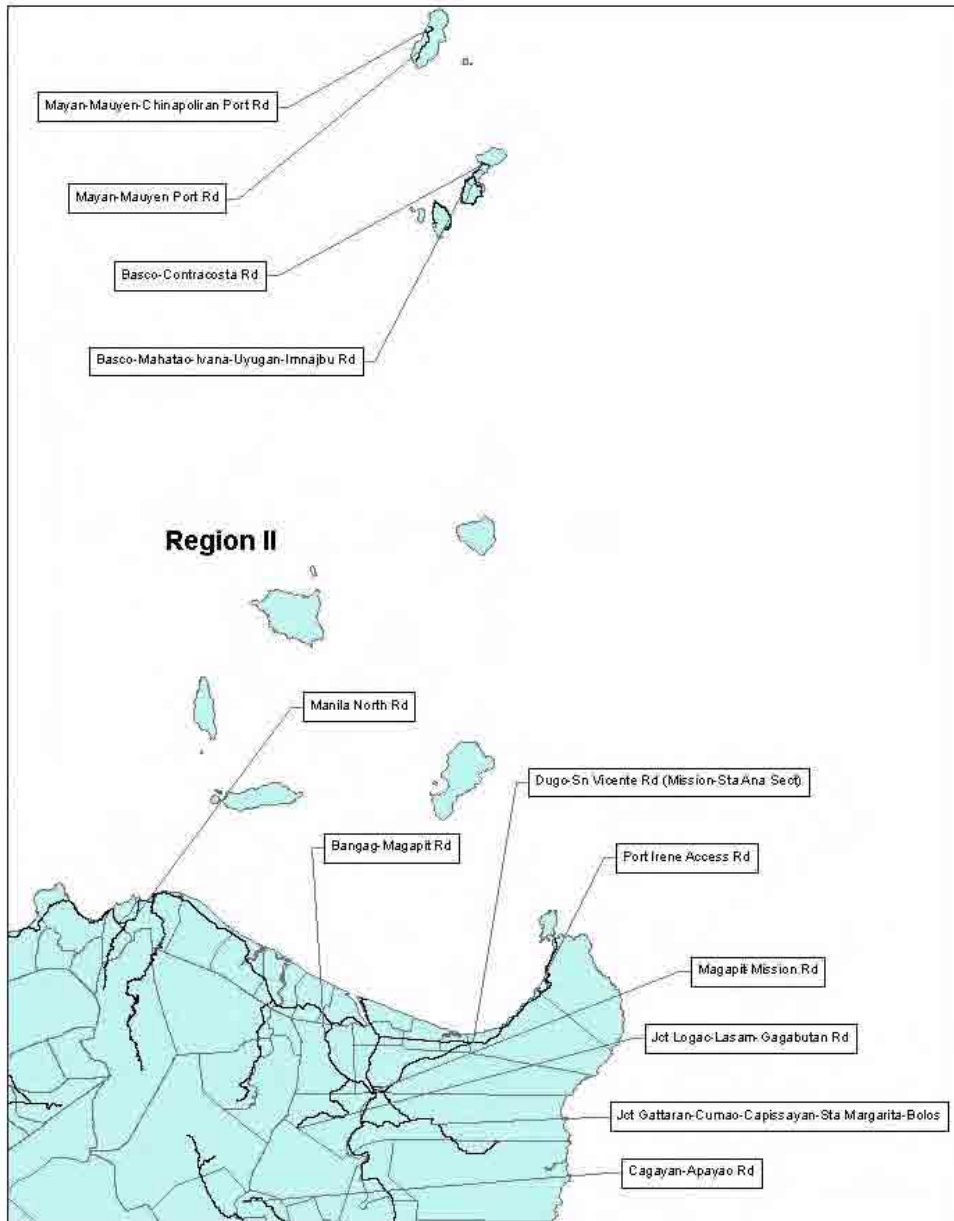
**Location of Road Section with Actual RCD Risk**

**Region I (2/2)**

Road Name  
IRCDa ≥ 4

Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa



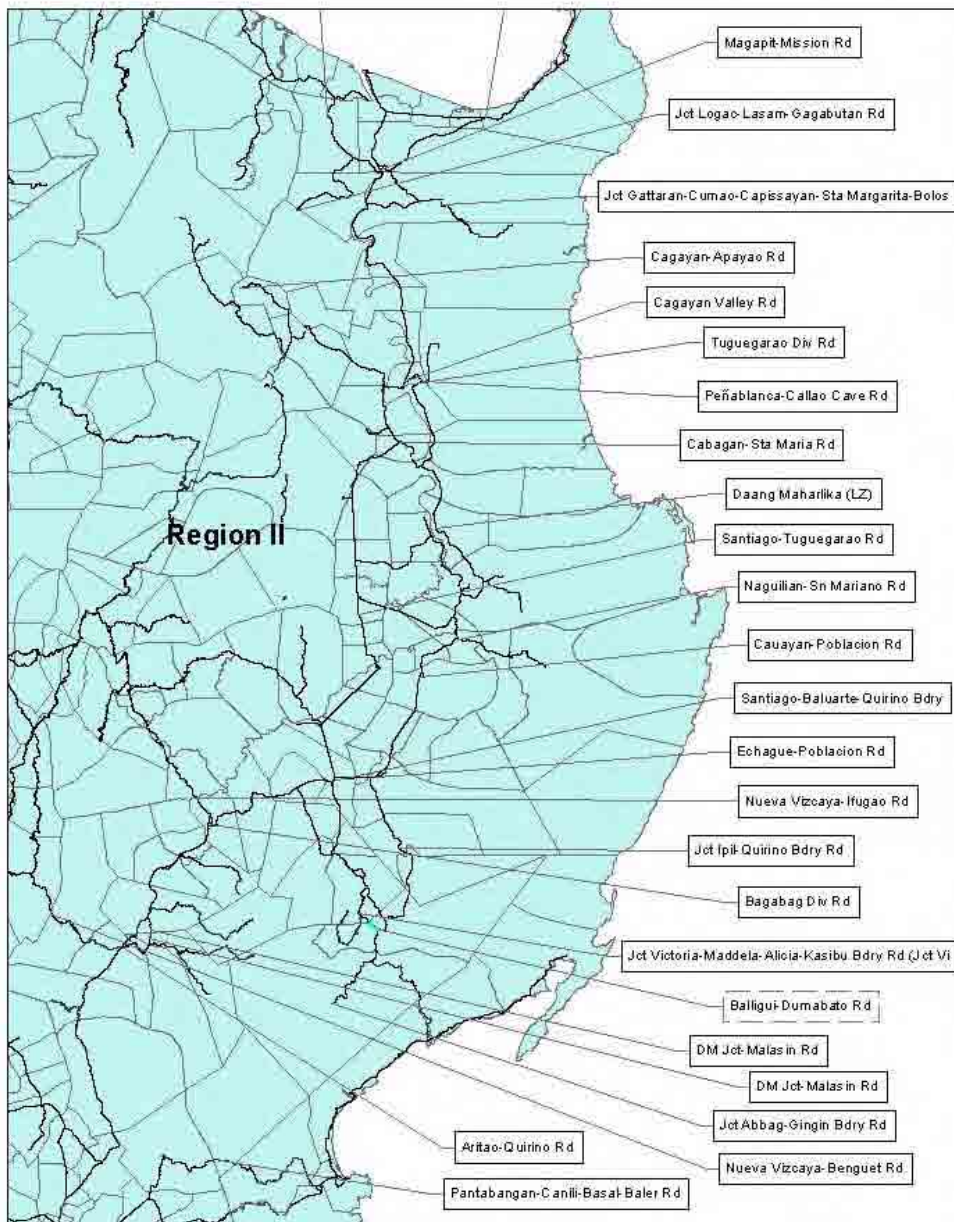
**Location of Road Section with Actual RCD Risk**

**Region II (1/2)**

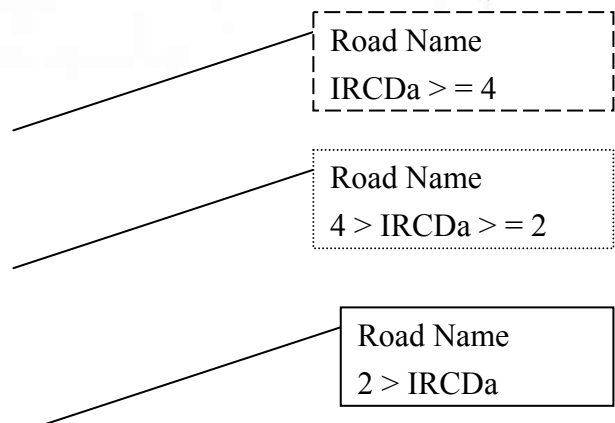
Road Name  
IRCDa ≥ 4

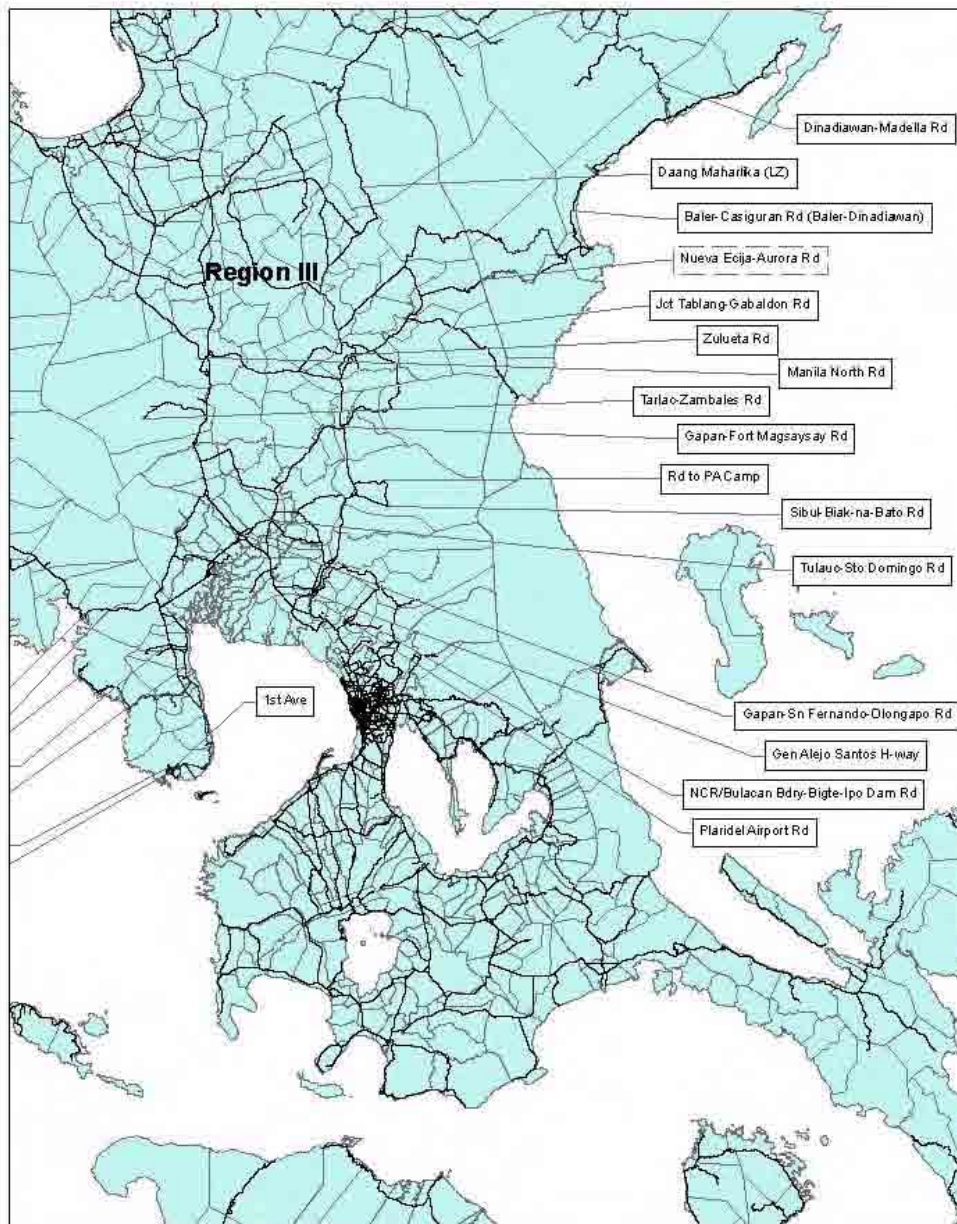
Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa



**Location of Road Section  
with Actual RCD Risk  
Region II (2/2)**





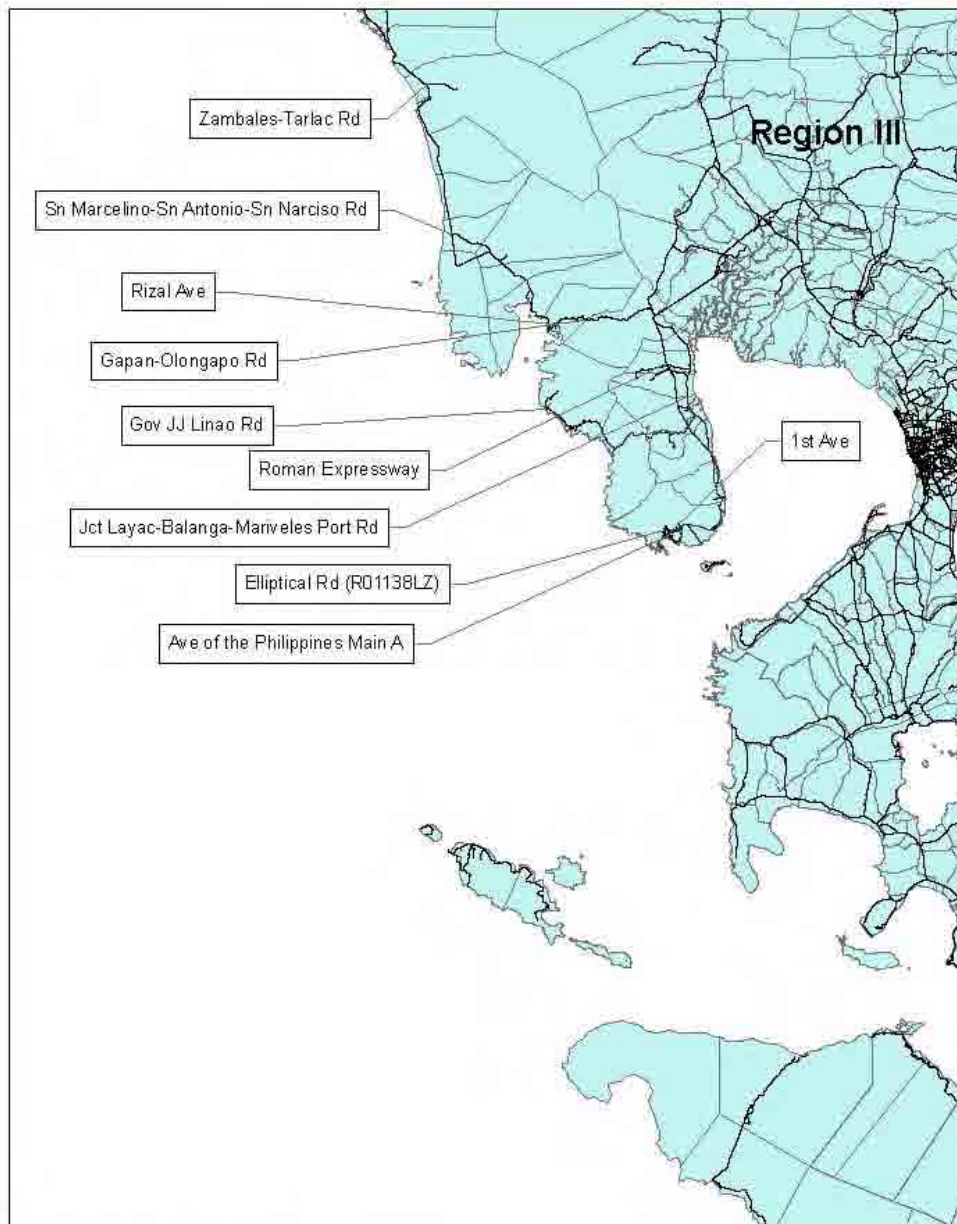
**Location of Road Section  
with Actual RCD Risk  
Region III (1/2)**

Road Name  
IRCDa > = 4

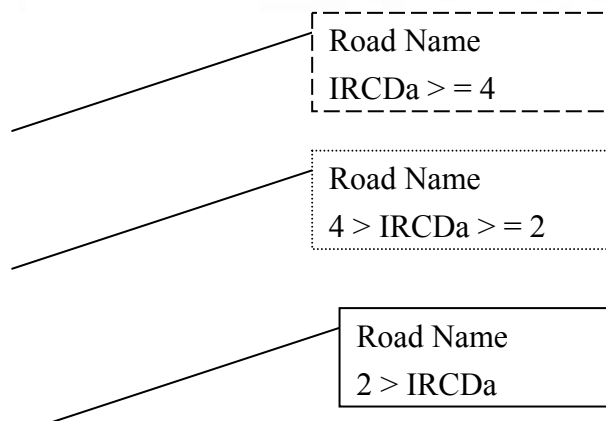
Road Name  
4 > IRCDa > = 2

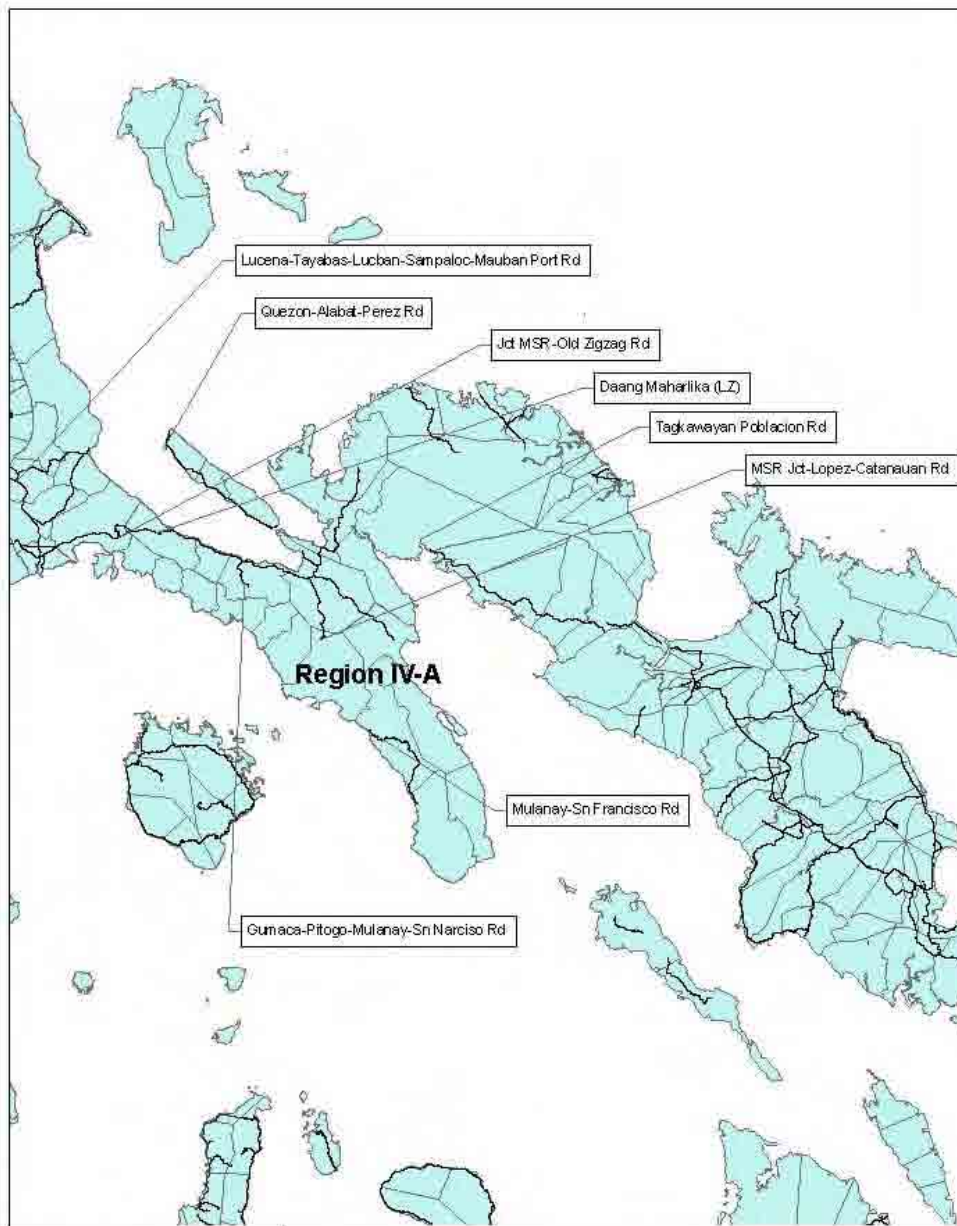
Road Name  
2 > IRCDa





**Location of Road Section  
with Actual RCD Risk  
Region III (2/2)**



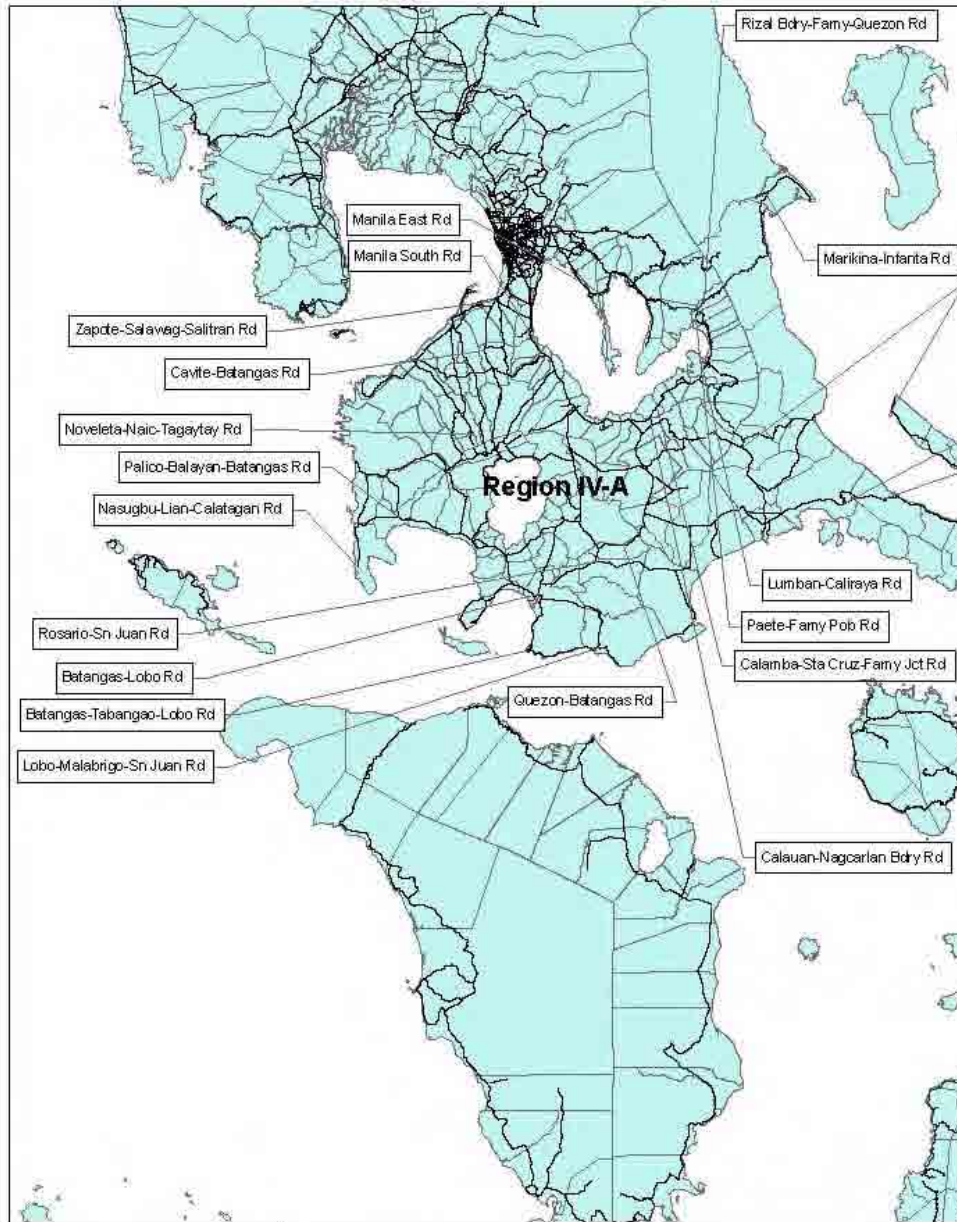


**Location of Road Section  
with Actual RCD Risk  
Region IV A (1/2)**

Road Name  
IRCDa  $\geq 4$

Road Name  
 $4 > \text{IRCDa} \geq 2$

Road Name  
 $2 > \text{IRCDa}$

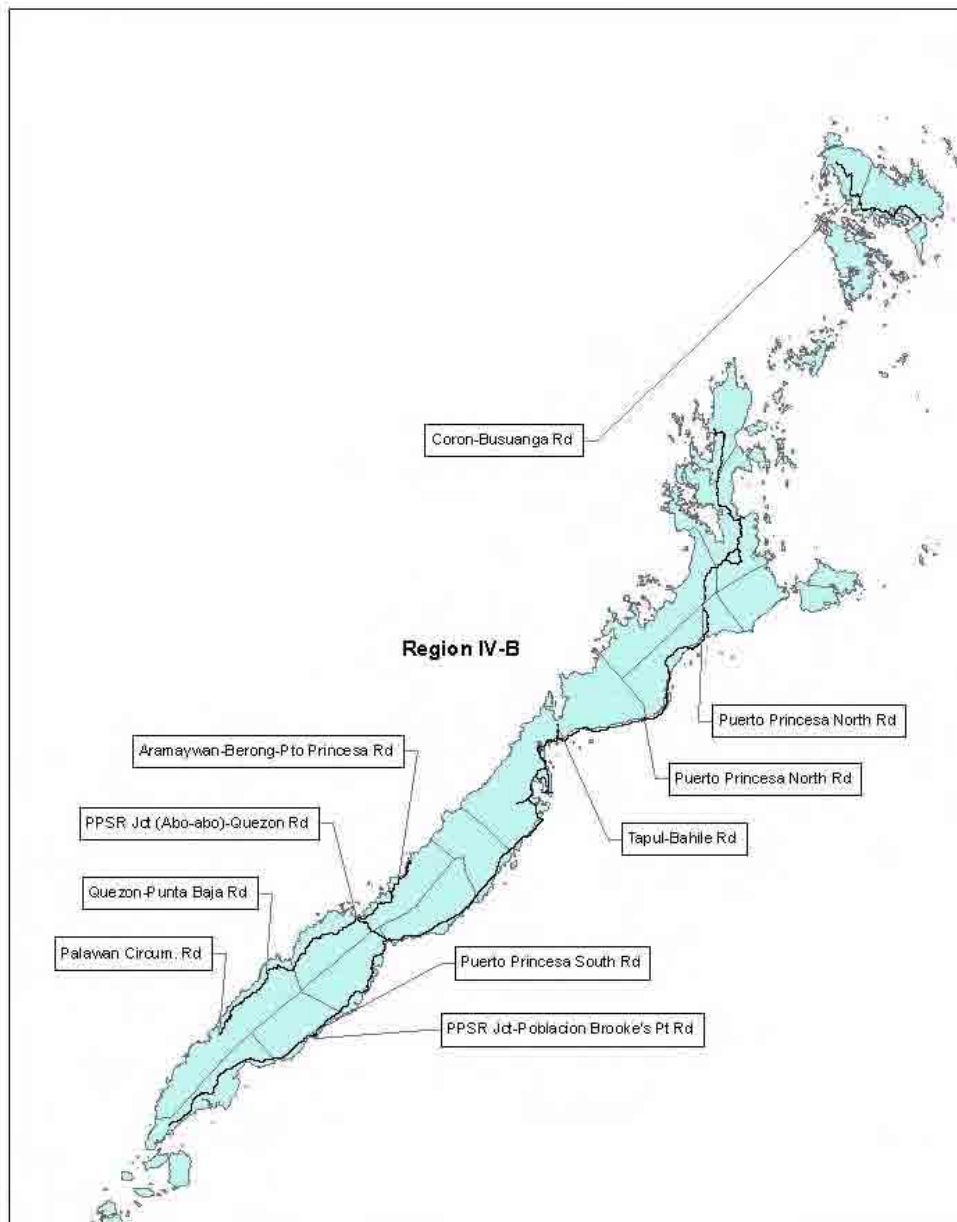


**Location of Road Section  
with Actual RCD Risk  
Region IV A (2/2)**

Road Name  
IRCDa  $\geq 4$

Road Name  
 $4 > \text{IRCDa} \geq 2$

Road Name  
 $2 > \text{IRCDa}$

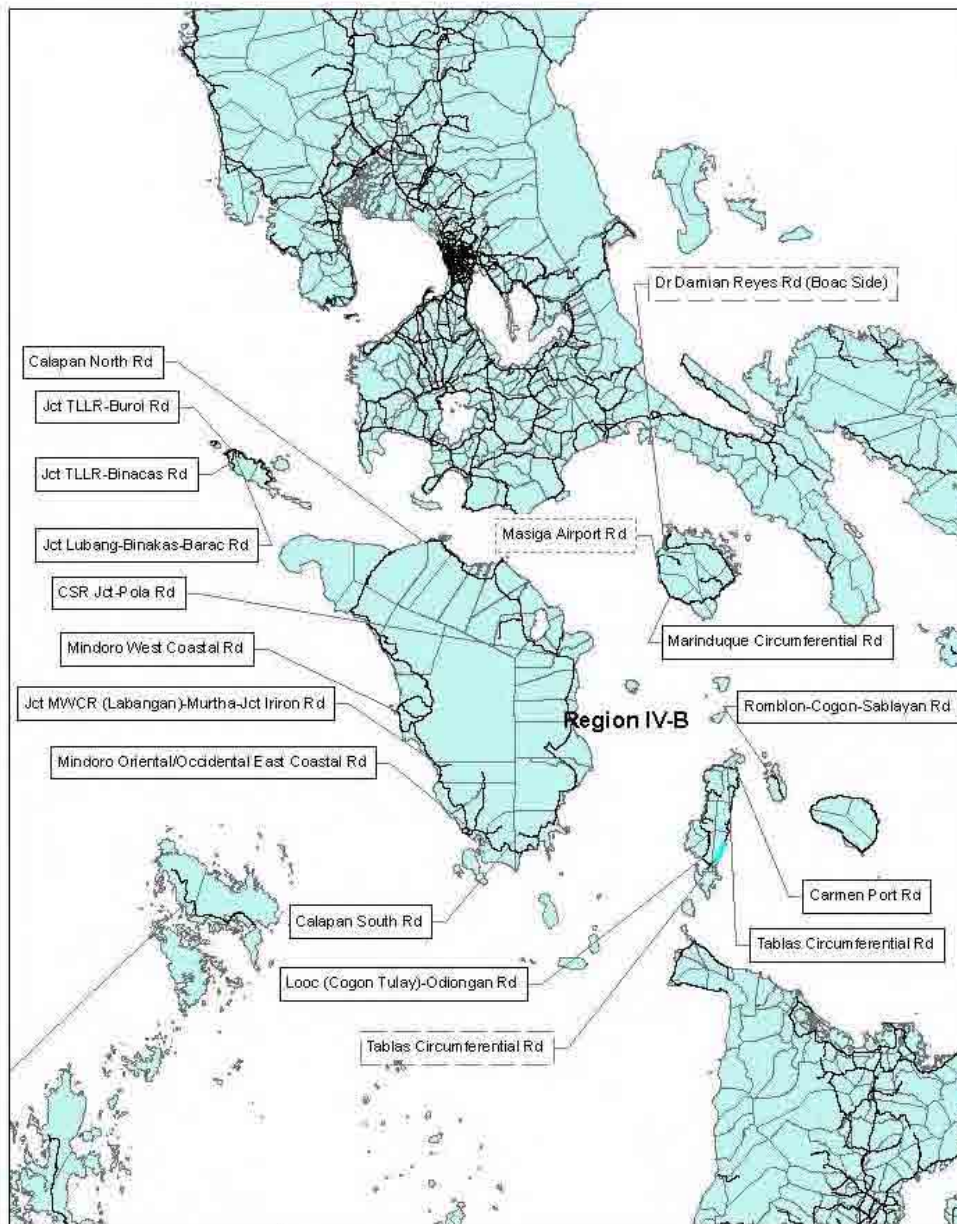


**Location of Road Section with Actual RCD Risk Region IV B (1/2)**

Road Name  
IRCDa  $\geq$  4

Road Name  
 $4 >$  IRCDa  $\geq$  2

Road Name  
 $2 >$  IRCDa

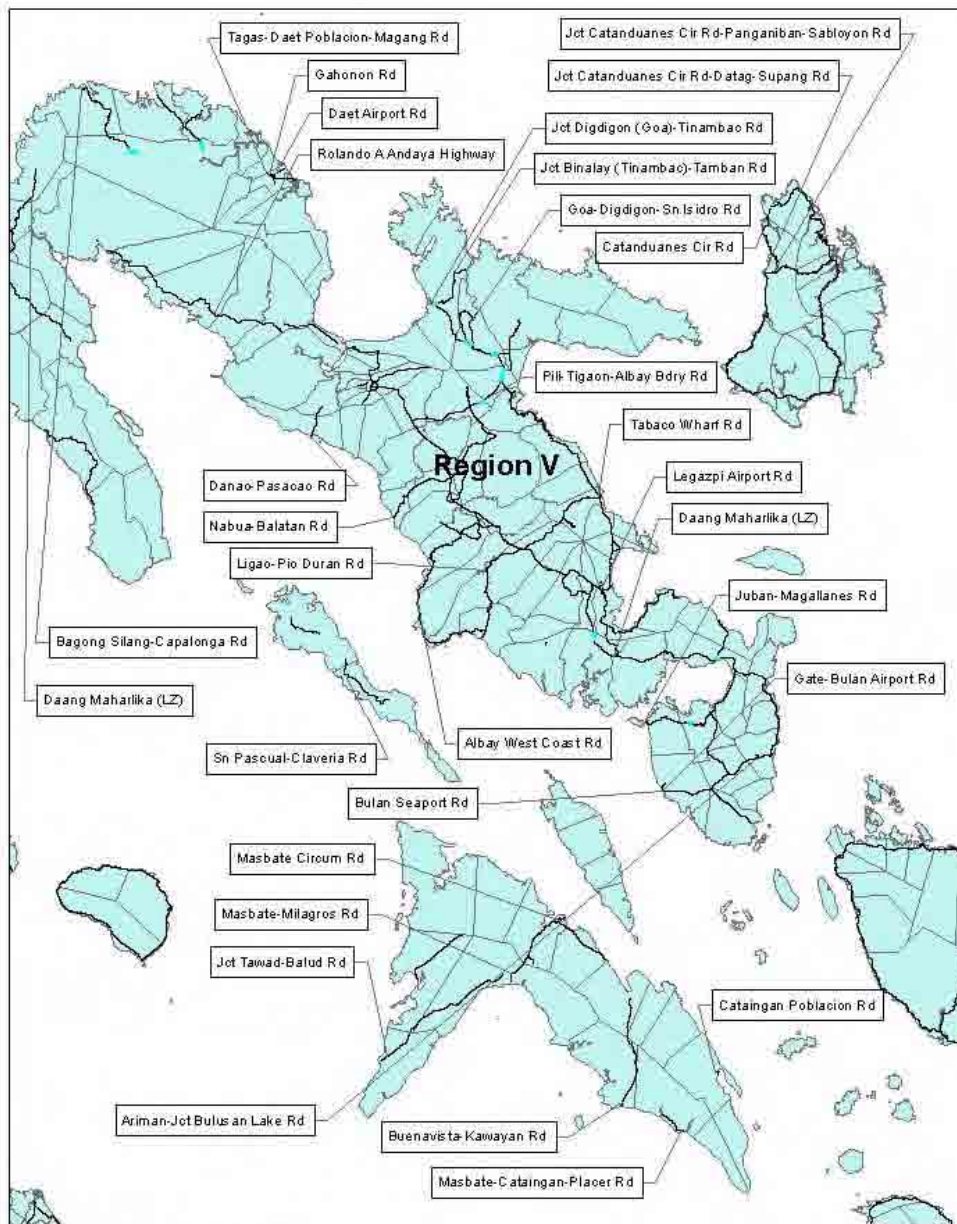


**Location of Road Section with Actual RCD Risk Region IV B (2/2)**

Road Name  
IRCDa ≥ 4

Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa

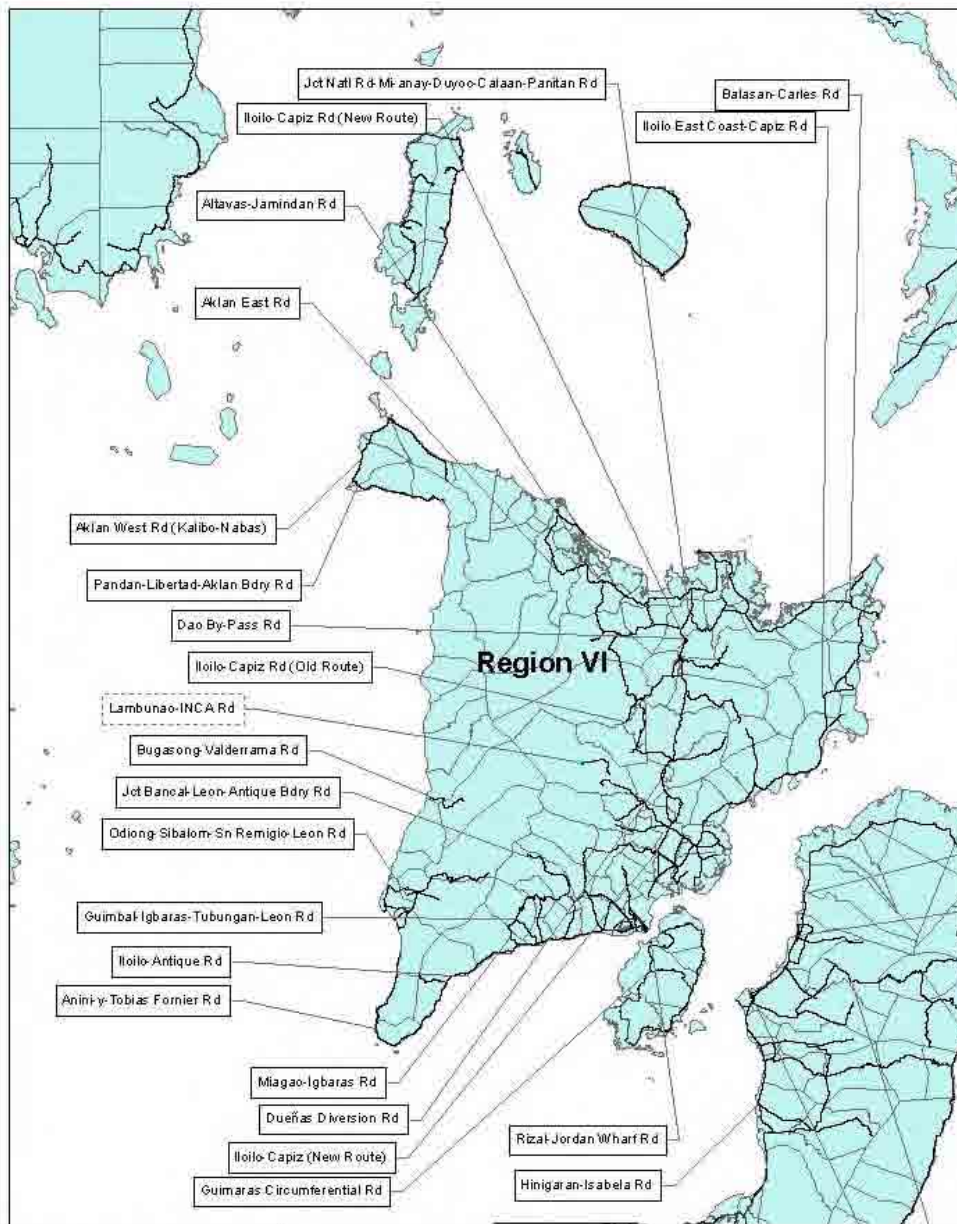


**Location of Road Section  
with Actual RCD Risk  
Region V**

Road Name  
IRCDa ≥ 4

Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa



**Location of Road Section  
with Actual RCD Risk  
Region VI (1/2)**

Road Name

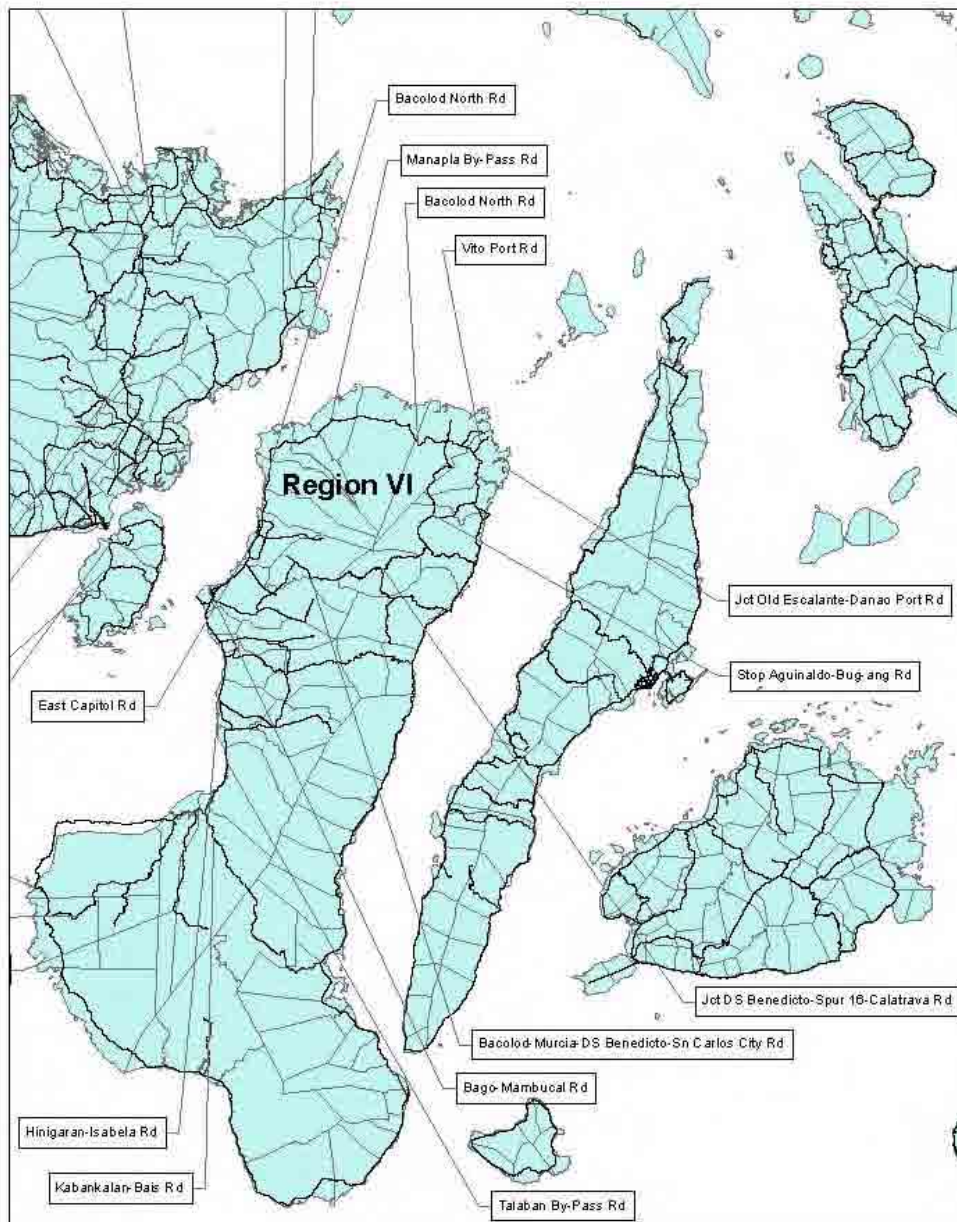
IRCDa  $\geq$  4

Road Name

4 > IRCDa  $\geq$  2

Road Name

2 > IRCDa



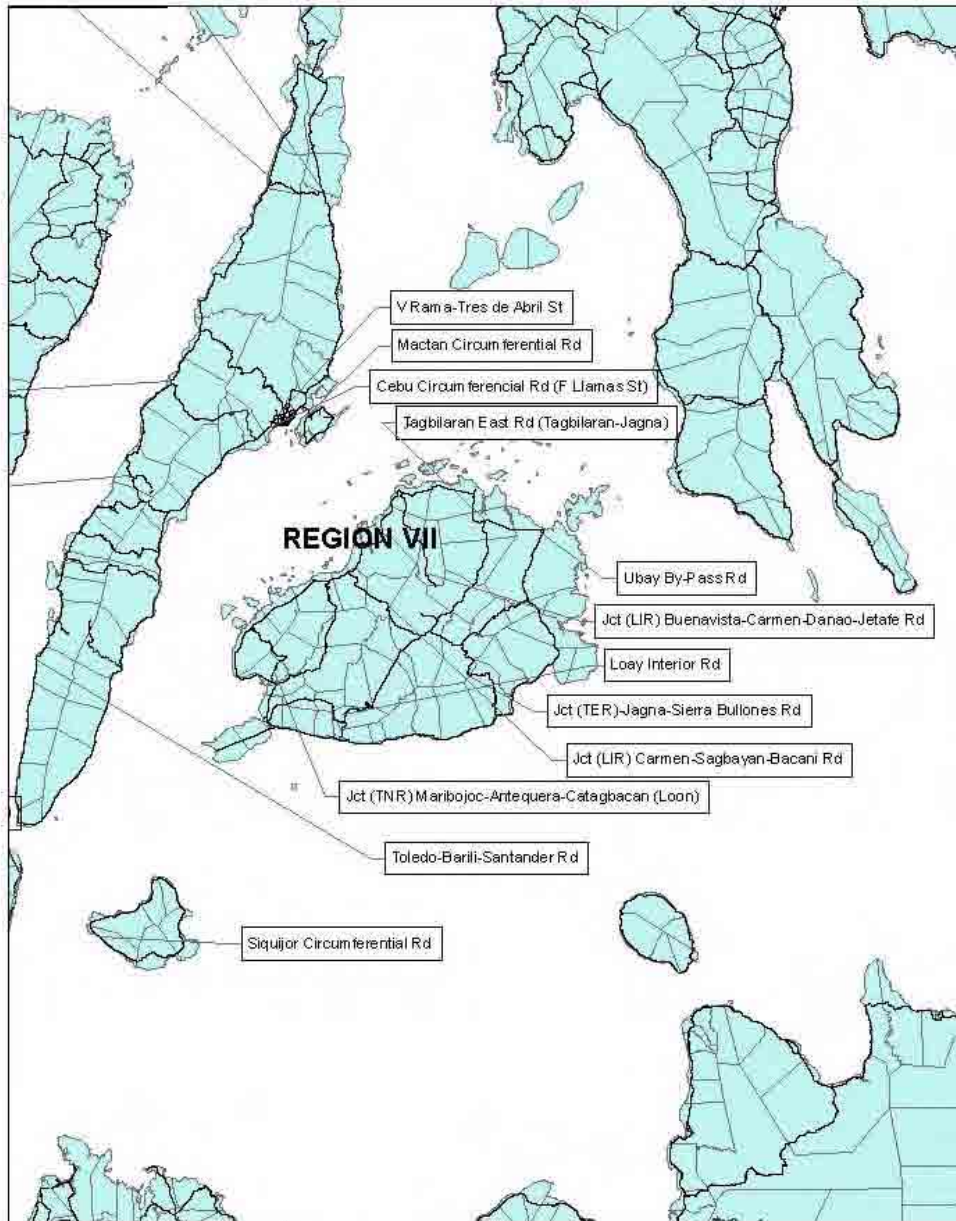
**Location of Road Section with Actual RCD Risk Region VI (2/2)**

Road Name  
IRCDa ≥ 4

Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa



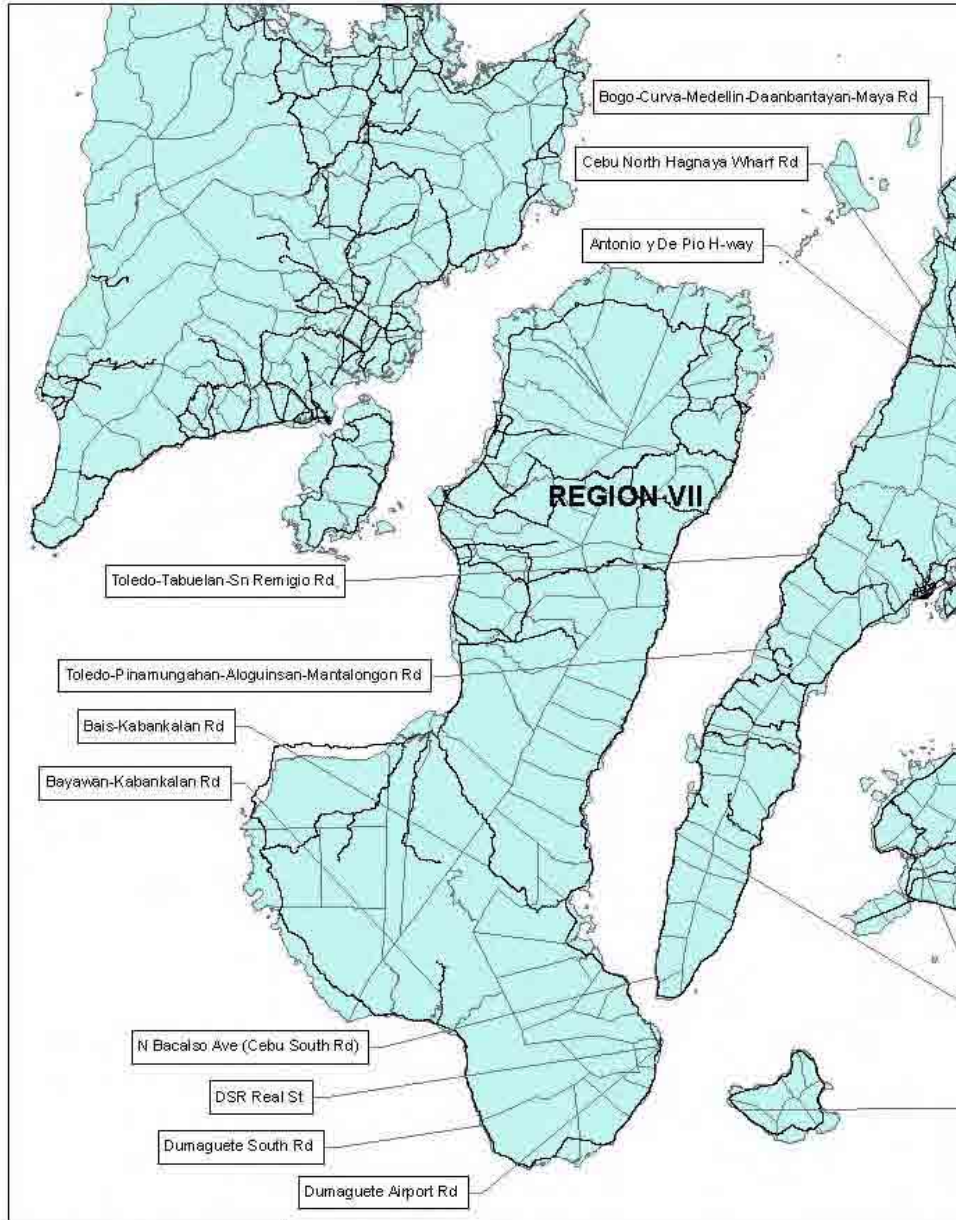


**Location of Road Section with Actual RCD Risk Region VII (1/2)**

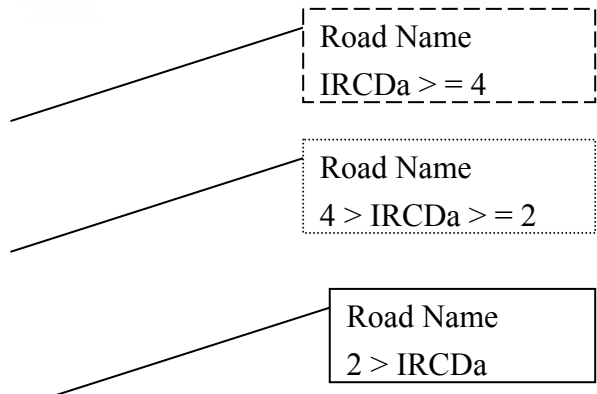
Road Name  
IRCDa  $\geq$  4

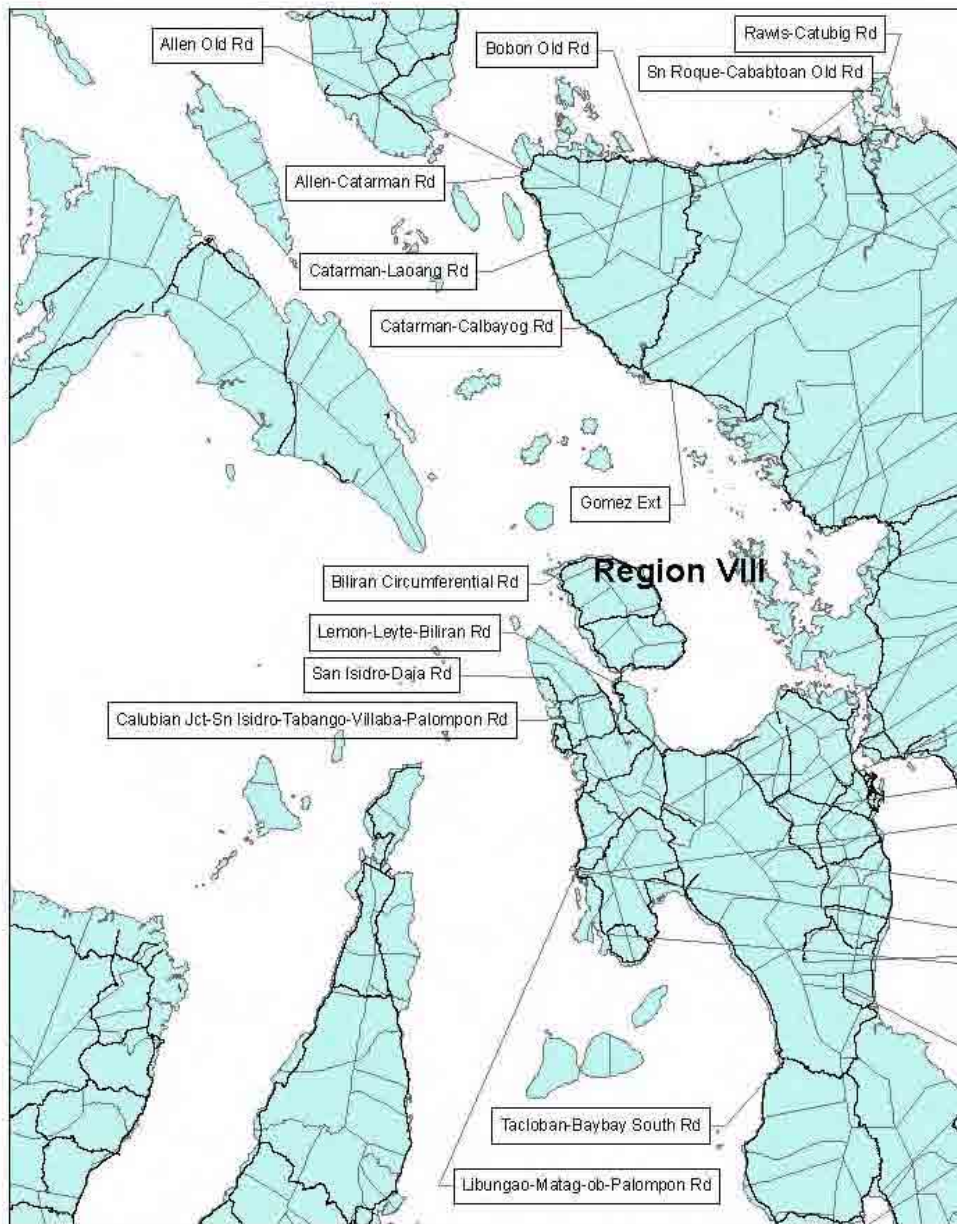
Road Name  
 $4 >$  IRCDa  $\geq$  2

Road Name  
 $2 >$  IRCDa



**Location of Road Section  
with Actual RCD Risk  
Region VII (2/2)**





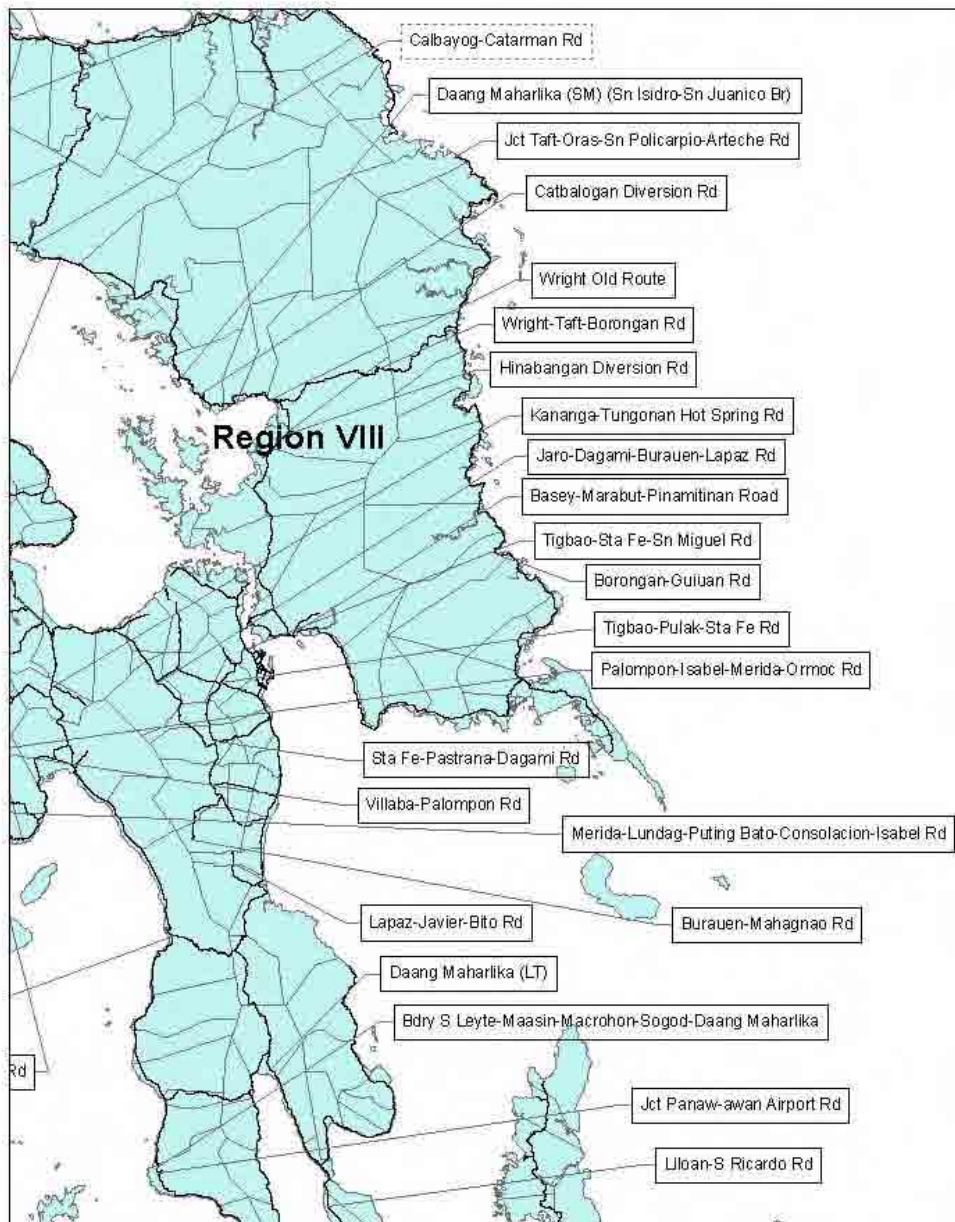
**Location of Road Section with Actual RCD Risk**

**Region VIII (1/2)**

Road Name  
IRCDa  $\geq$  4

Road Name  
 $4 >$  IRCDa  $\geq$  2

Road Name  
 $2 >$  IRCDa



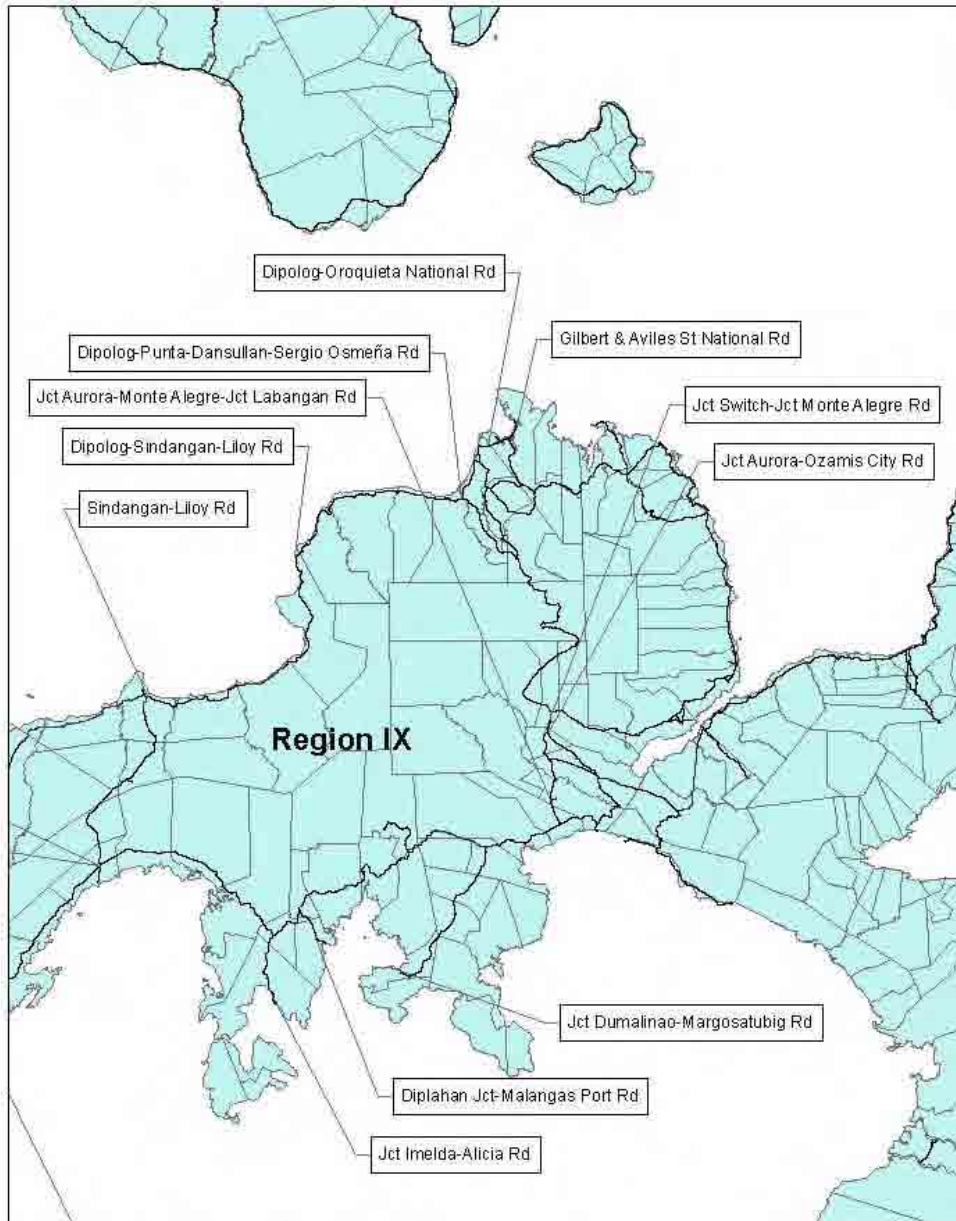
**Location of Road Section  
with Actual RCD Risk**

**Region VIII (2/2)**

Road Name  
IRCDa ≥ 4

Road Name  
4 > IRCDa ≥ 2

Road Name  
2 > IRCDa



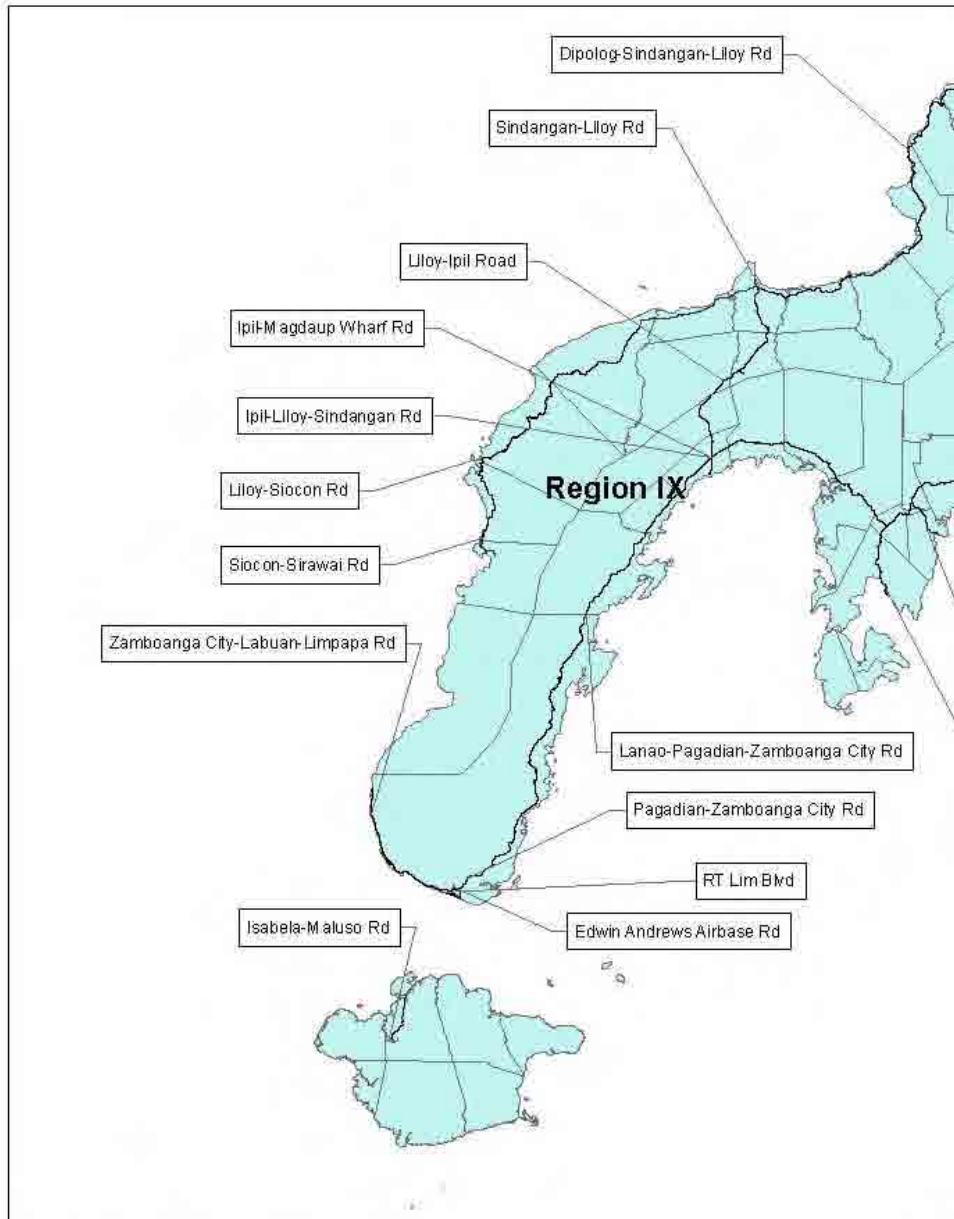
**Location of Road Section with Actual RCD Risk**

**Region IX (1/2)**

Road Name  
IRCDa ≥ 4

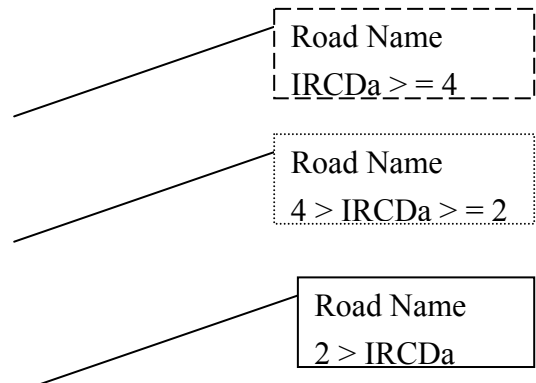
Road Name  
4 > IRCDa ≥ 2

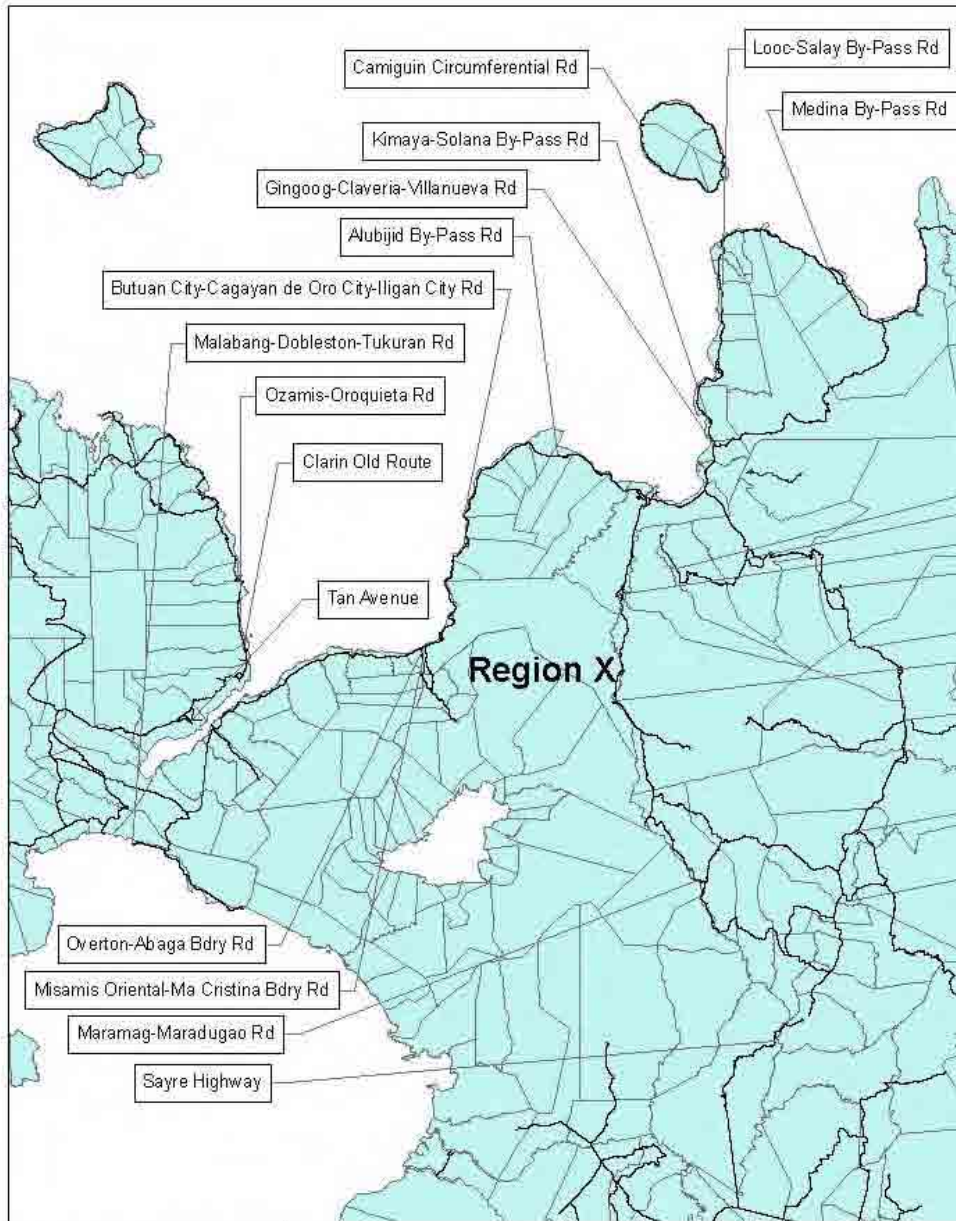
Road Name  
2 > IRCDa



**Location of Road Section with Actual RCD Risk**

**Region IX (2/2)**





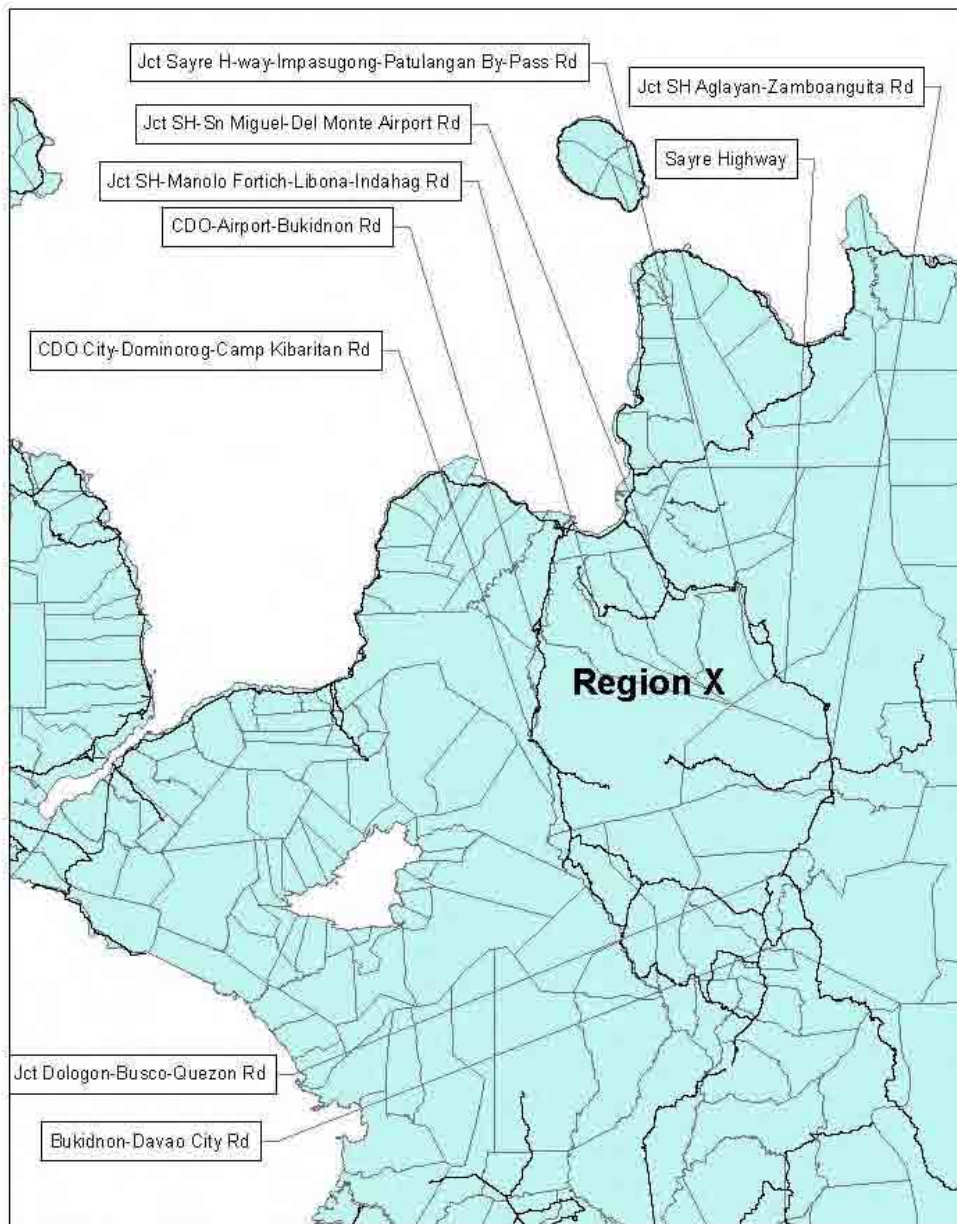
**Location of Road Section with Actual RCD Risk**

**Region X (1/2)**

Road Name  
IRCDa  $\geq$  4

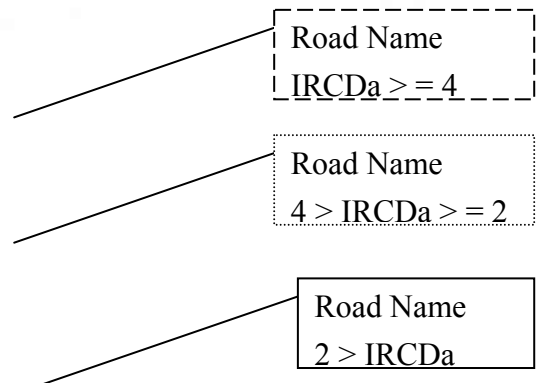
Road Name  
4 > IRCDa  $\geq$  2

Road Name  
2 > IRCDa

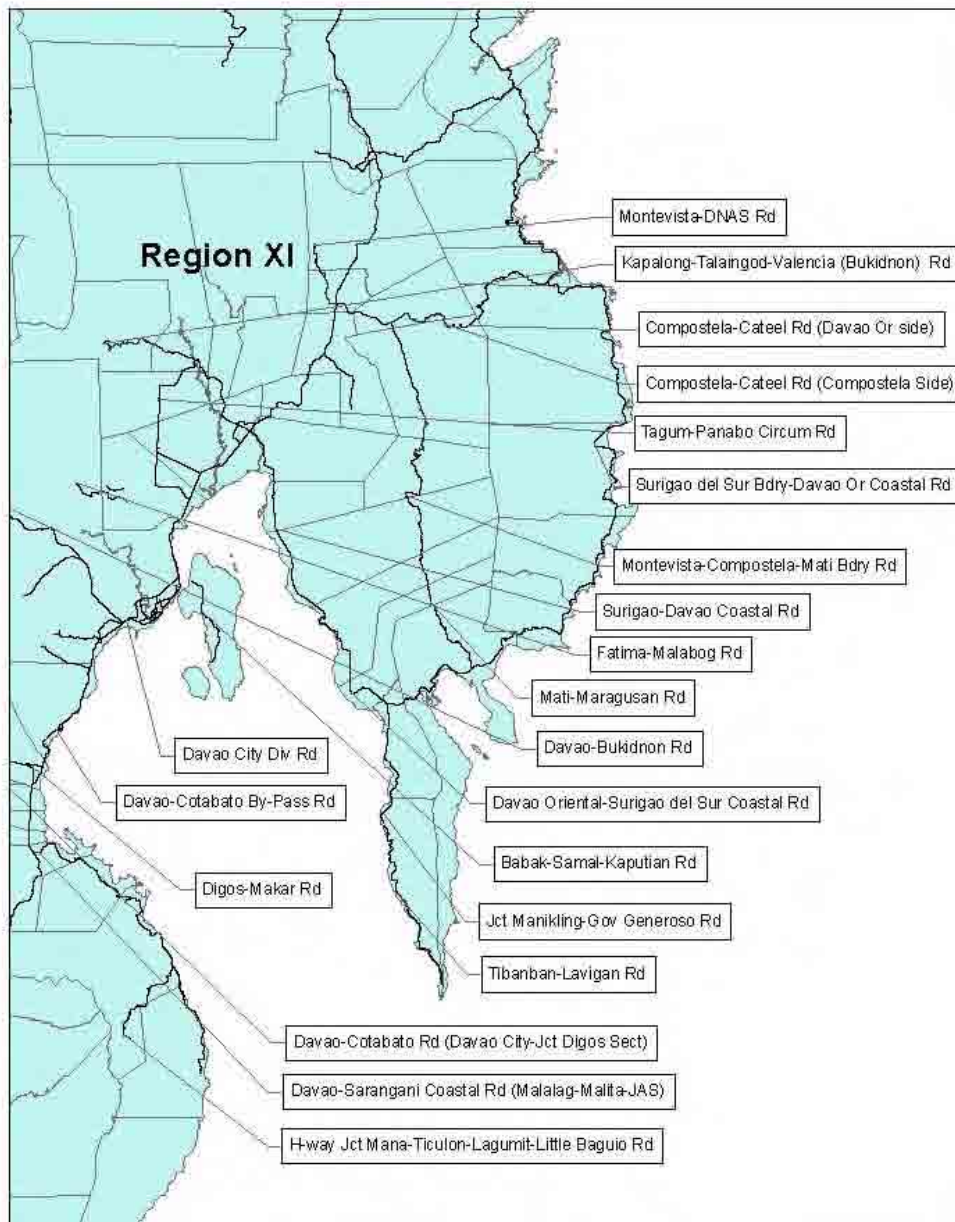


**Location of Road Section  
with Actual RCD Risk**

**Region X (2/2)**







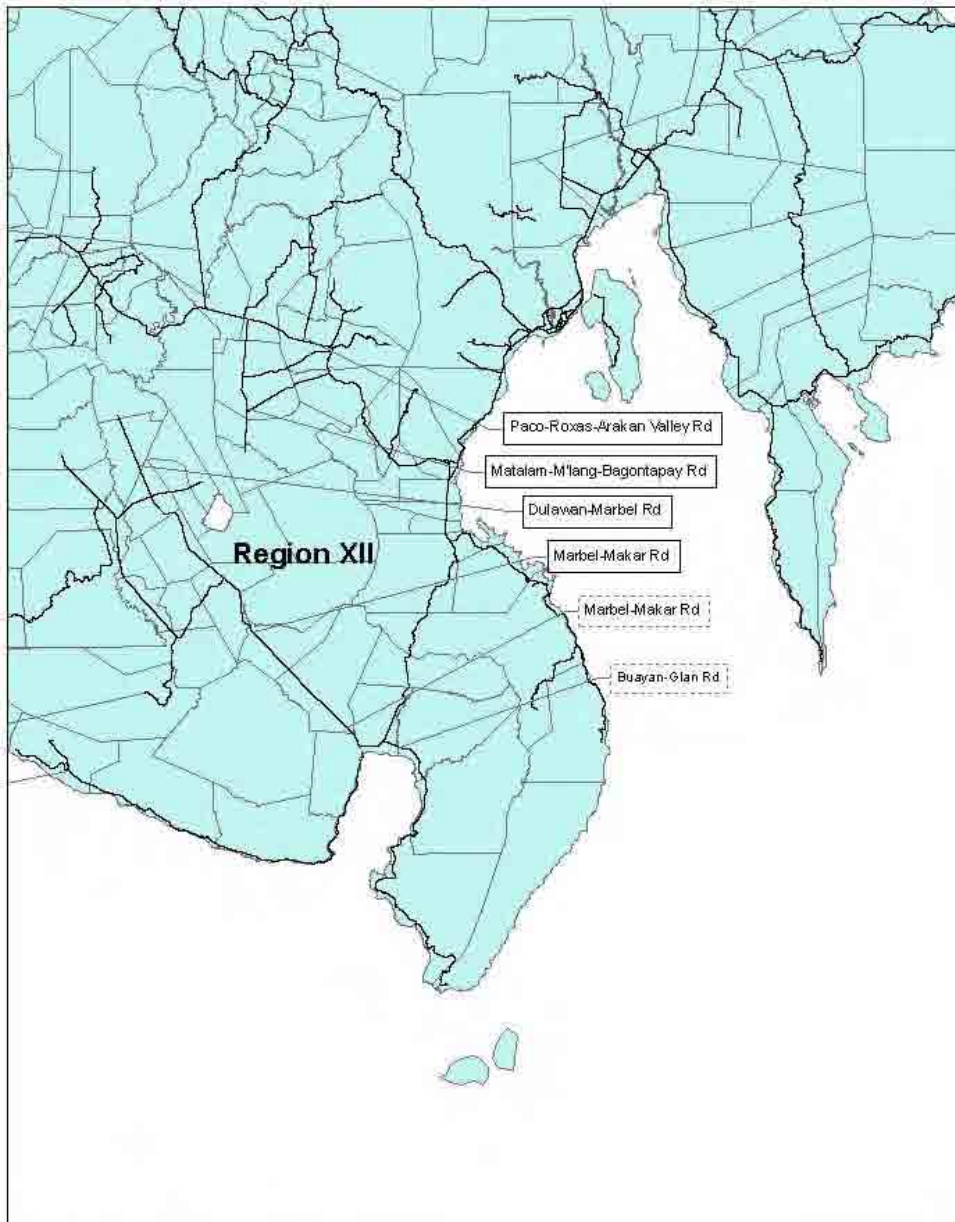
**Location of Road Section with Actual RCD Risk**

**Region XI**

Road Name  
IRCDa  $\geq$  4

Road Name  
4 > IRCDa  $\geq$  2

Road Name  
2 > IRCDa



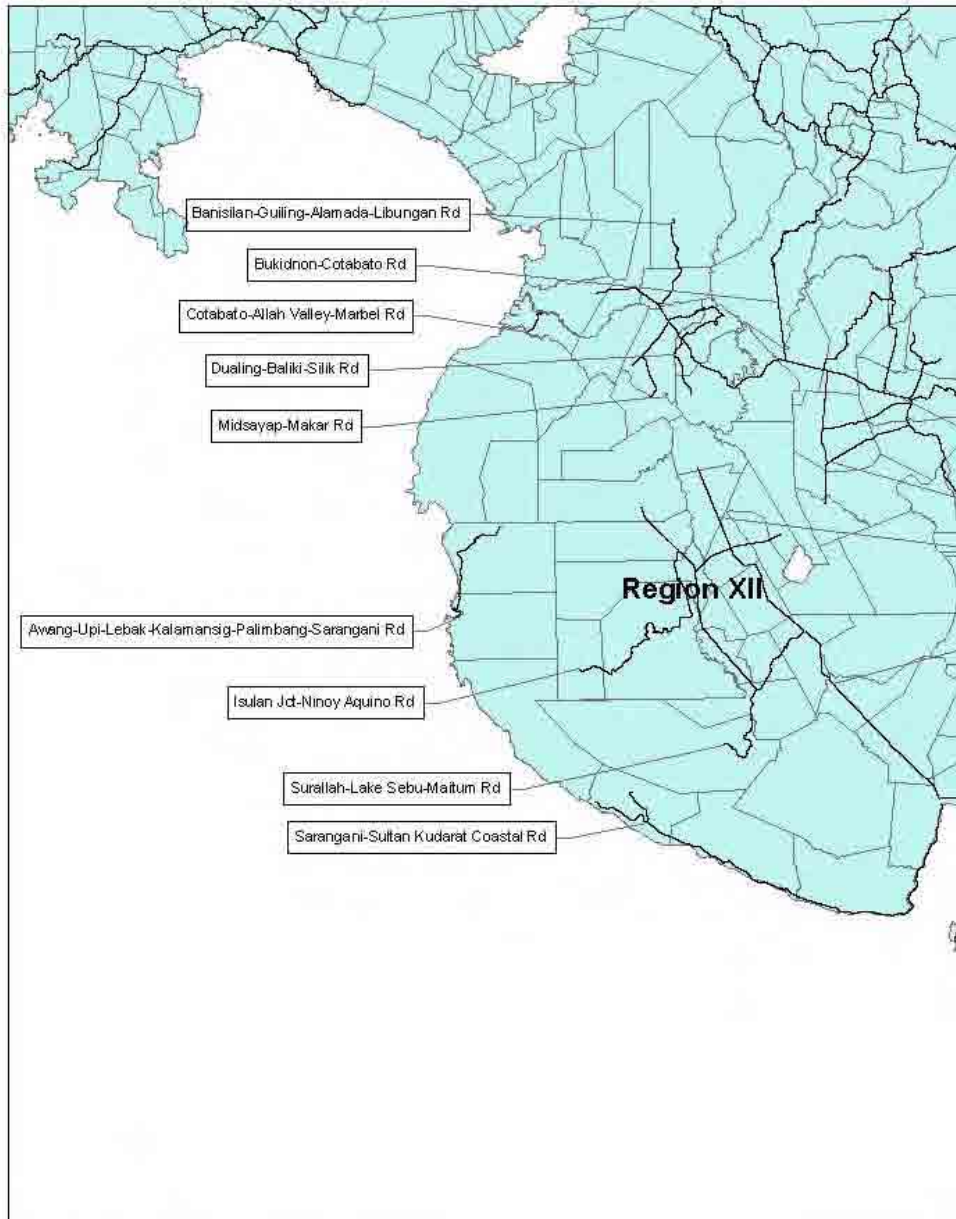
**Location of Road Section with Actual RCD Risk**

**Region XII (1/2)**

Road Name  
IRCDa  $\geq$  4

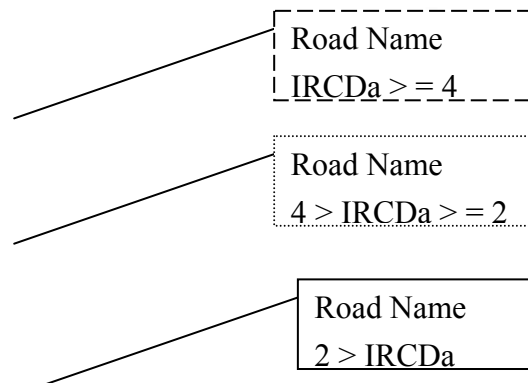
Road Name  
 $4 >$  IRCDa  $>=$  2

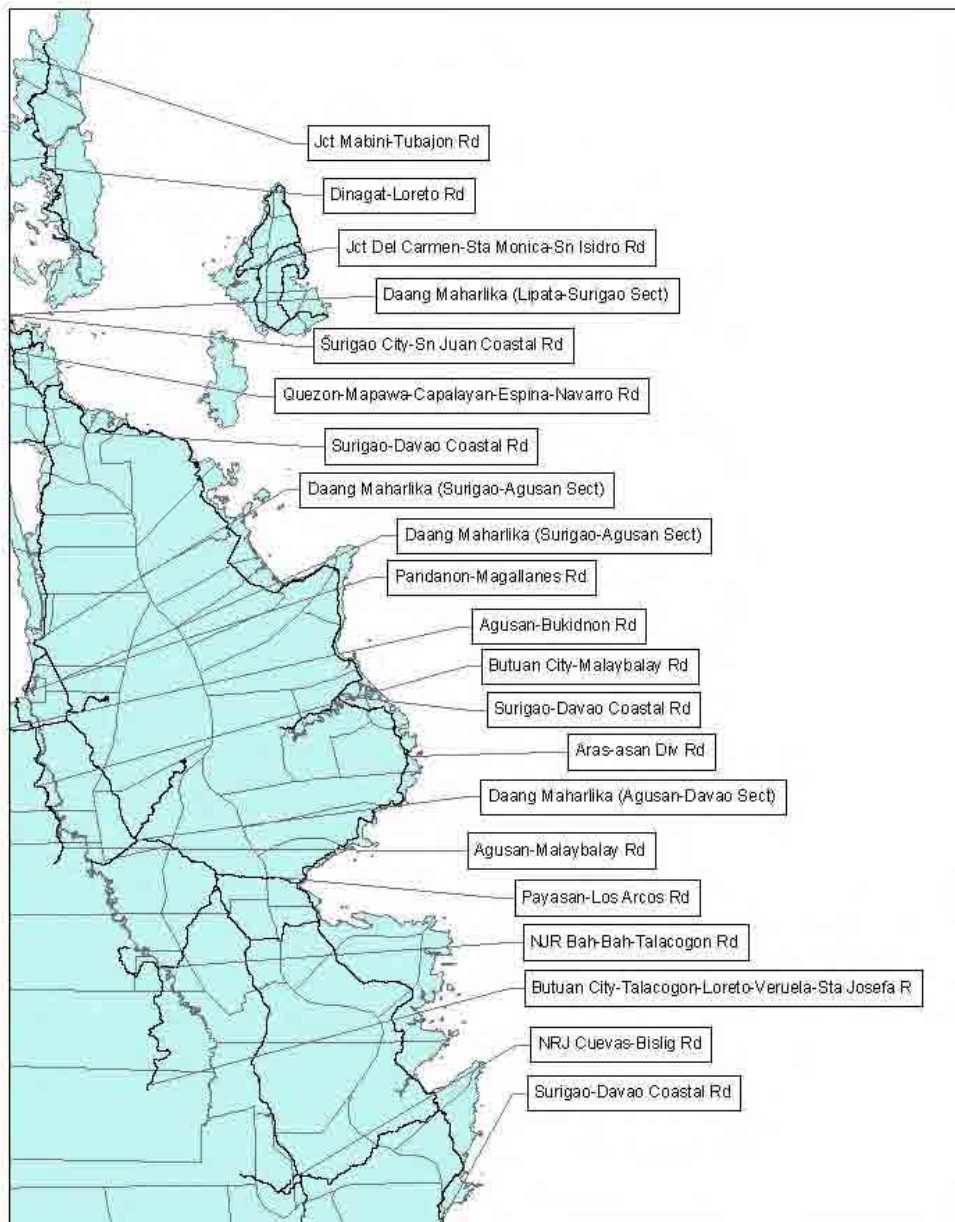
Road Name  
 $2 >$  IRCDa



**Location of Road Section  
with Actual RCD Risk**

**Region XII (2/2)**





**Location of Road Section with Actual RCD Risk**

**Region XIII**

