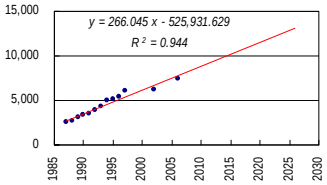
APPENDIX 4 ECONOMIC ANALYSIS

4.1. RESULTS OF TRAFFIC ESTIMATION

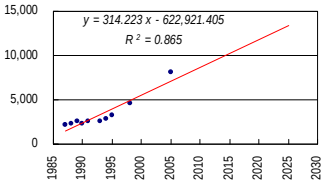
1. Results of Linier Regression for each Bridge's Traffic Volume

Route 1

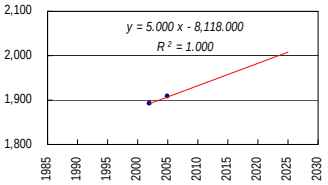
Bridge 2, Aranjuez Brdg. Station:EP-08



Bridge 3, Abangares Brdg. Station:504

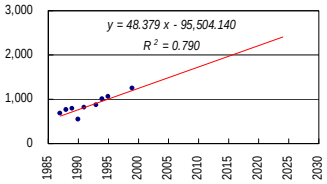


Bridge 7, Azufrado Brdg. Station:EP-20

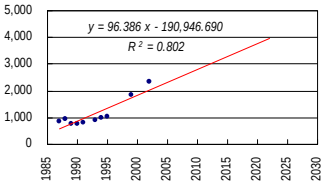


Route 2

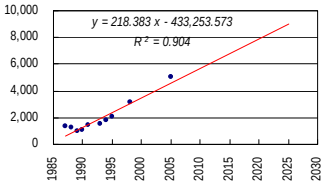
Bridge 12, Puerto Nuevo Brdg. Station: 710



Bridge 16, Nuevo Brdg. Station: 711

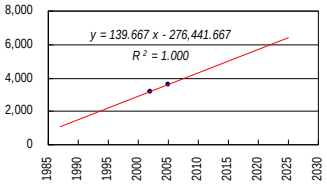


or Station: 712

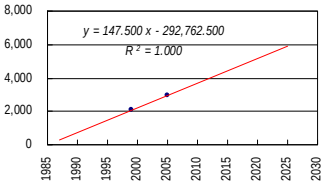


Route 4

Bridge 17, Chirripo Brdg. Station: 155

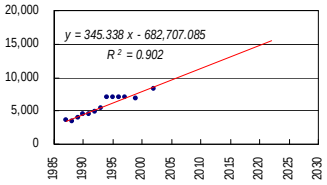


Bridge 19, Sarapiqui Brdg. Station: 158

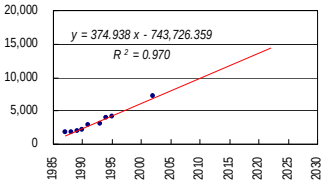


Route 32

Bridge 20, Sucio Brdg. Station: EP-14

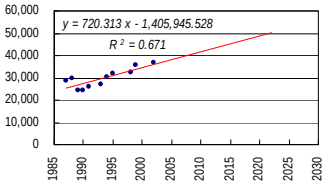


Bridge 26,Chirripo Brdg Station: 247



Route 218

Bridge 29, Torres Brdg. Station: 159



2. Historical Data of Traffic Volume at each Bridge

Note

- TPD means the Traffic per Day
- The value of each vehicle category is the % of TPD.

Source : MOPT Planification

year	R1														
	No2					No3					No7				
	TPD	Passenger	2or3-axis	Bus	5-axis	TPD	Passenger	2or3-axis	Bus	5-axis	TPD	Passenge	2or3-axis	Bus	5-axis
1987	2,628	40.0	33.0	5.7	21.2	2,145	39.5	30.6	7.3	22.6					
1988	2,740	39.3	31.9	6.4	22.4	2,360									
1989	3,095	40.7	30.9	6.5	22.0	2,590	41.3	29.8	5.7	23.3					
1990	3,370	33.5	33.2	6.6	26.6	2,245	35.7	32.5	6.8	25.0					
1991	3,468					2,550	34.3	32.2	6.6	26.9					
1992	3,872	36.6	29.9	5.1	28.4										
1993	4,274	41.2	30.3	6.7	21.9	2,570	38.5	29.7	6.8	25.0					
1994	4,970					2,855									
1995	5,140	32.3	27.1	5.5	35.1	3,200	33.6	28.2	5.9	32.3					
1996	5,460														
1997	6,120														
1998						4,625	39.4	27.6	5.5	27.5					
1999															
2000															
2001															
2002	6,194	43.1	25.0	5.9	26.0						1,892	46.3	21.5	7.4	24.9
2003															
2004															
2005	7,452	45.0	19.7	5.1	30.2	8,120	36.5	27.9	5.7	29.9	1,907	42.2	15.5	4.9	37.4
2006	7,452	45.0	19.7	5.1	30.2										

year	R2										R4									
	No12					No16					No17					No19				
	TPD	Passenge	2or3-axis	Bus	5-axis	TPD	Passenge	2or3-axis	Bus	5-axis	TPD	Passenger	2or3-axis	Bus	5-axis	TPD	Passenge	2or3-axis	Bus	5-axis
1987	680	32.9	31.4	6.0	29.7	855														
1988	750					940														
1989	795					780	30.5	33.0	6.7	29.9										
1990	540	25.4	30.7	8.0	35.9	780	29.1	42.8	5.3	22.8										
1991	800	30.2	39.1	4.9	25.8	815	27.9	42.7	6.2	23.1										
1992																				
1993	865	36.2	29.7	5.9	28.2	915	33.5	38.3	5.2	23.0										
1994	990	35.5	29.2	5.3	30.0	1,010	21.1	39.0	6.8	33.1										
1995	1,050	35.8	29.5	5.6	29.1	1,050	35.0	37.2	5.4	22.4										
1996																				
1997																				
1998																				
1999	1,235	35.8	31.1	4.5	28.6	1,835	36.4	36.9	6.3	20.5						2,090	32.9	34.5	3.8	28.9
2000																				
2001																				
2002						2,326					3,171									
2003																				
2004																				
2005											3,590	43.7	27.2	2.9	26.1	2,975	33.0	34.1	3.7	29.2
2006																				

year	R32										R218				
	No20					No26					No29				
	TPD	Passenger	2or3-axis	Bus	5-axis	TPD	Passenger	2or3-axis	Bus	5-axis	TPD	Passenger	2or3-axis	Bus	5-axis
1987	3,546	35.6	34.1	6.0	24.3	1,750	20.3	29.2	8.3	42.2	28,800				
1988	3,488	41.5	31.8	6.5	20.2	1,780					29,970	62.5	23.9	9.9	3.7
1989	3,936	37.1	34.4	4.8	23.8	1,920					24,250	64.5	22.1	10.4	3.0
1990	4,433	37.7	31.9	6.3	24.1	2,110					24,270	64.4	20.6	12.4	2.6
1991	4,577	32.5	34.9	6.7	25.9	2,905					26,055	64.8	21.1	12.0	2.2
1992	4,910	35.9	34.9	5.4	23.8										
1993	5,462	38.7	34.9	6.0	20.4	2,995					27,110	70.8	14.8	12.5	1.9
1994	6,950	39.2	32.8	4.9	23.2	3,890	29.2	30.5	4.2	36.1	30,525				
1995	6,993	42.3	28.2	5.9	23.7	4,185	33.3	26.2	4.8	35.7	31,870	72.1	15.3	10.3	2.3
1996	7,040	42.4	27.7	5.5	24.4										
1997	7,075	39.5	27.0	6.0	27.6										
1998											32,660	75.5	12.7	10.6	1.2
1999	6,770	38.3	23.7	4.0	34.0						35,825	77.7	11.9	8.9	1.5
2000															
2001															
2002	8,360	45.5	18.1	3.3	33.2	7,194					36,854				
2003															
2004															
2005															
2006															

4.2. VOC PARAMETER

Km/h	Passenger	2-axis	5-axis
15	169,551.5	249,296.6	298,878.1
20	139,549.0	190,113.4	237,973.1
25	118,714.8	149,747.3	195,425.2
30	104,449.6	122,564.2	169,101.8
35	93,922.5	104,409.1	150,142.6
40	86,278.5	95,490.2	142,305.1
45	80,686.0	91,468.6	141,492.3
50	76,898.6	91,608.9	140,589.0
55	74,094.6	93,565.5	147,737.8
60	72,571.2	97,218.5	153,744.6
65	71,726.2	101,914.7	162,202.1
70	70,922.8	106,054.3	166,745.8
75	70,520.0	109,713.4	176,849.6
80	69,594.0	113,714.7	182,677.3
85	69,501.3	116,519.2	192,472.5

Note

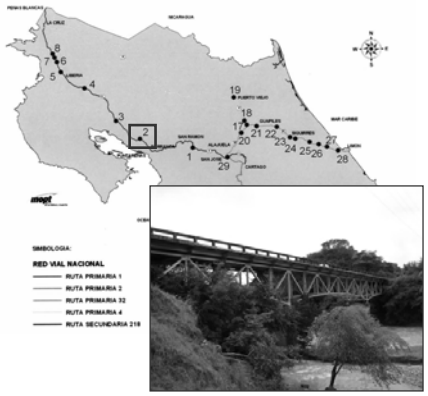
- Unit : colone/'000km in 2004 price
- VOC is summed up by the each category according to the HDM-III regulation.
  - Fuel / Combustible
  - Lubricant / Lubricante
  - Tires / Llantas
  - Manpower / Mano de Obra
  - Reserves / Repuestos
  - Depreciation / Depreciacion
  - Interest / Intereses

Source : MOPT Planification

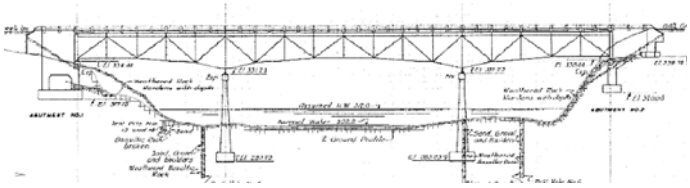
4.3. DETOUR ROUTE & BRIDGE LOCATION

1. Bridge Location for Rio Aranjuez Bridge (No.2)

Location : **Puntarenas Province**



Side View



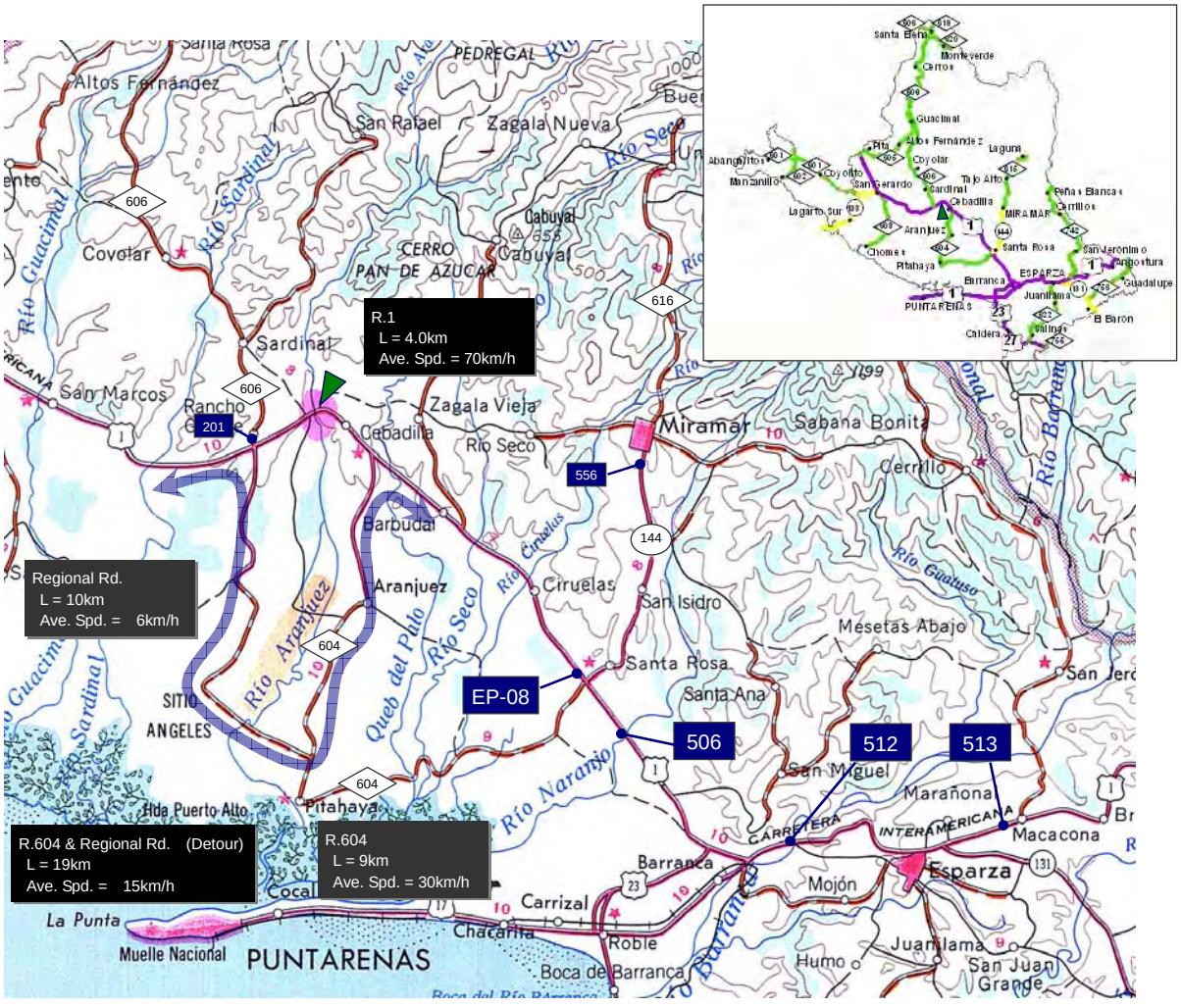
Design: 1950/11/17 | **Completion: 1955**

Length: 87.78m, Design Live Load: H15-S12

Sup: Steel Truss

Sub: Wall Type Pier, Rigid Frame Abutment

Foundation: Spread Foundations



EP-08		
1995	5,140 TPD	6.4%/year
1998	6,194 TPD	4.7%/year
2002	7,452 TPD	(5.5%/year)

506		
1995	4,850 TPD	10.1%/year
2002	9,507 TPD	

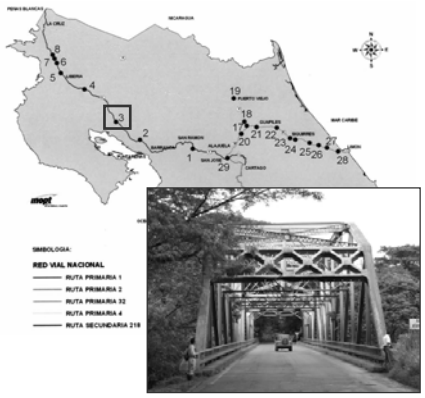
512		
1995	7,655 TPD	8.8%/year
2002	13,780 TPD	

513		
1995	5,500 TPD	4.0%/year
2002	7,218 TPD	

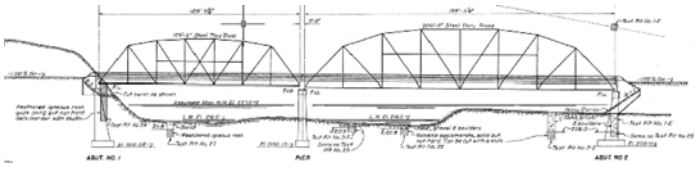
Primary Road
Secondary Road
Tertiary Road
Bridge Location
Traffic Survey Station

2. Bridge Location for Rio Abangares Bridge (No.3)

Location : Guanacaste Province



Side View



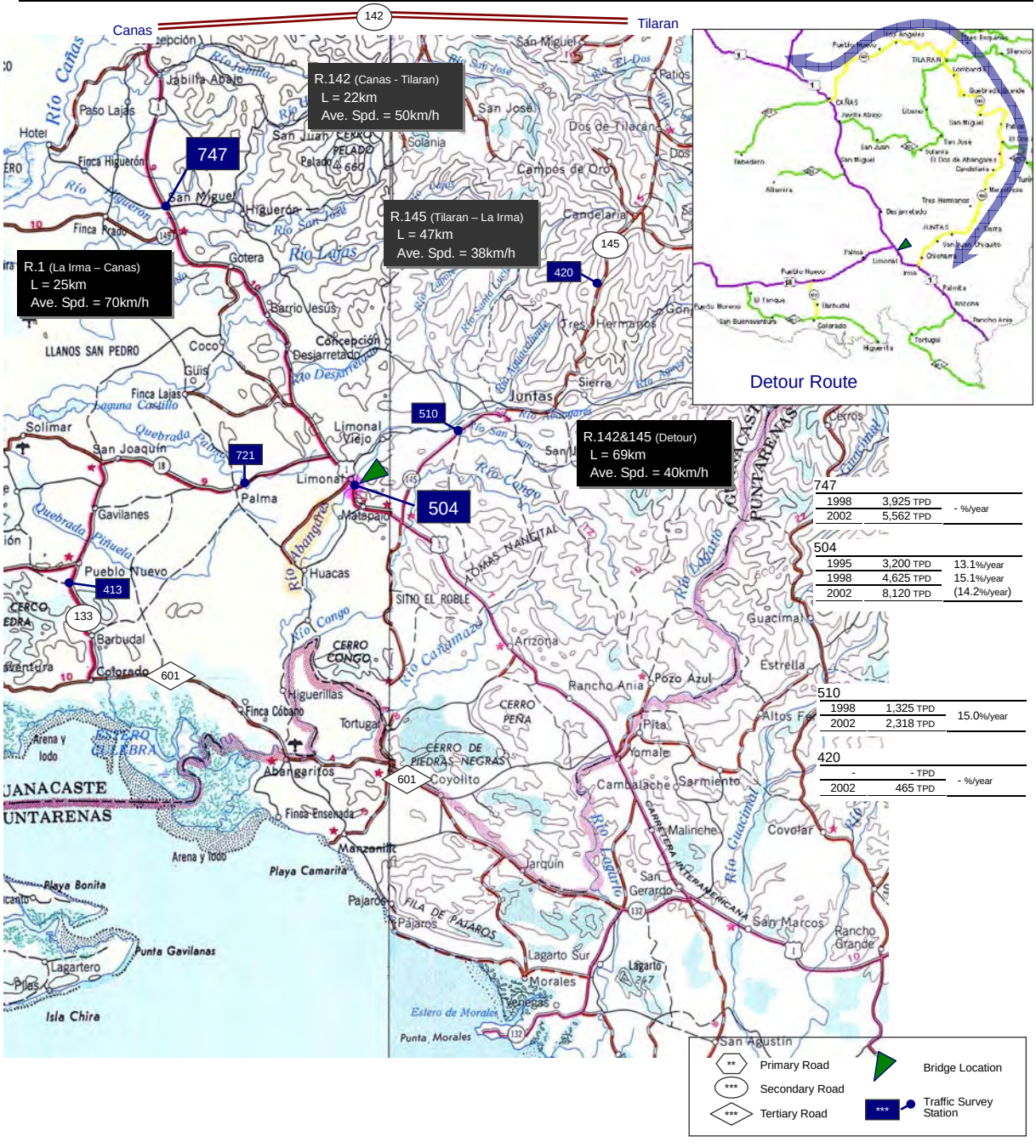
Design: 1952/03/07 | **Completion: 1953**

Length: 101.34m, Design Live Load: H15-S12-44

Sup: Steel Thru Truss

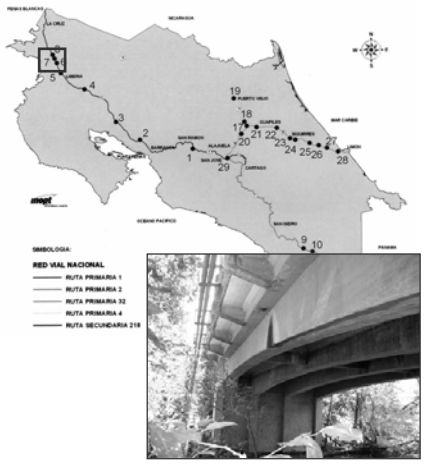
Sub: Wall Type Pier, Rigid Frame Abutment

Foundation: Spread Foundations

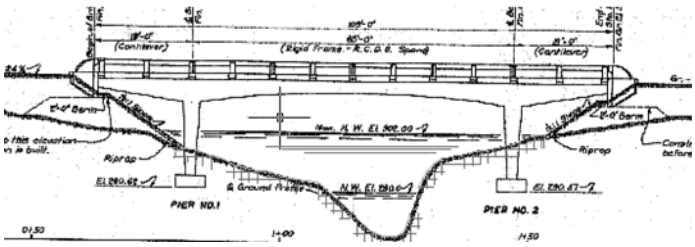


3. Bridge Location for Rio Azufrado Bridge (No.7)

Location : Guanacaste Province



Side View



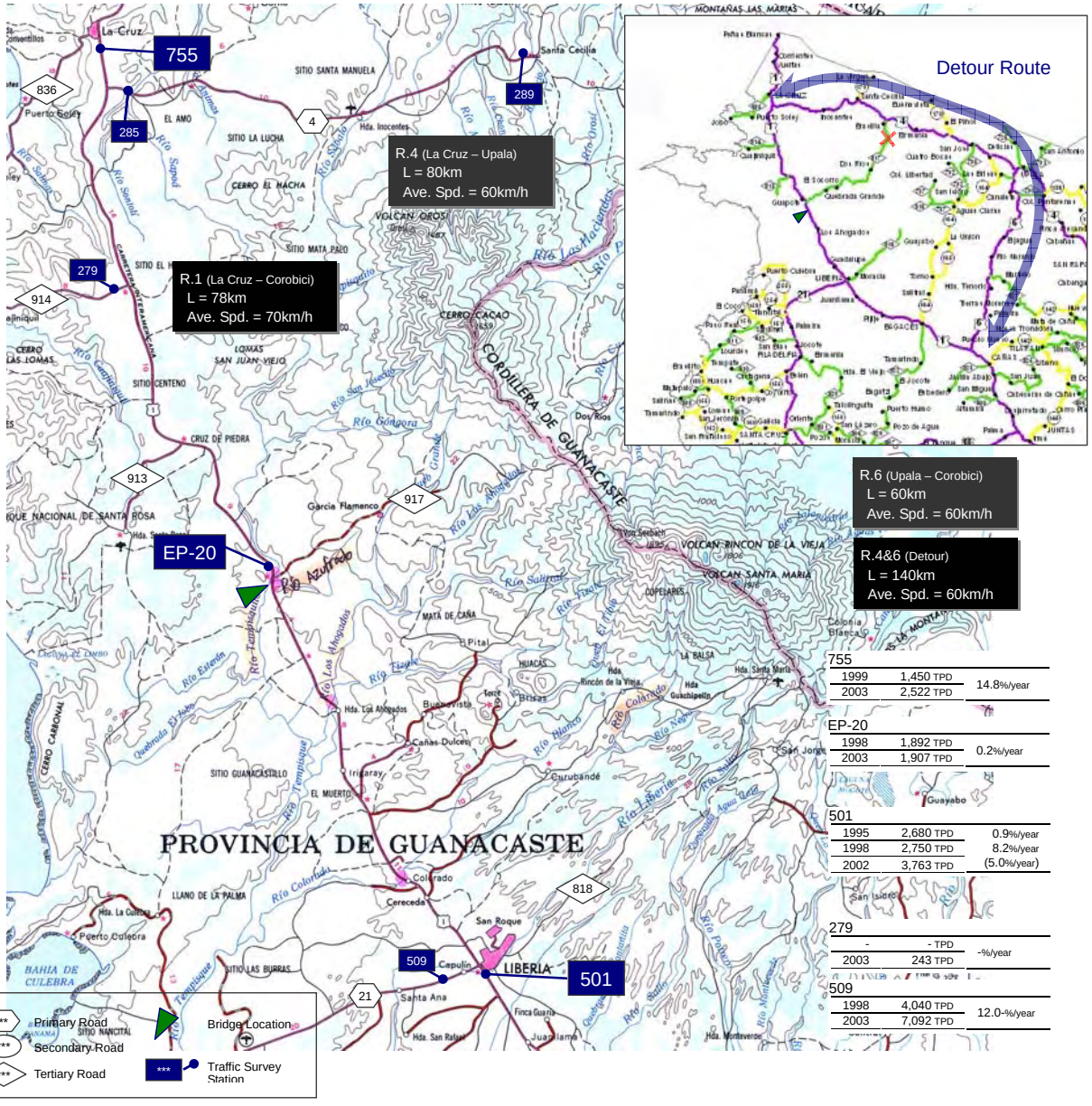
Design: 1953/09/08 | **Completion: 1955**

Length: 31.39m, Design Live Load: H15-S12-44

Sup: Rigid Reinforced Concrete Frame

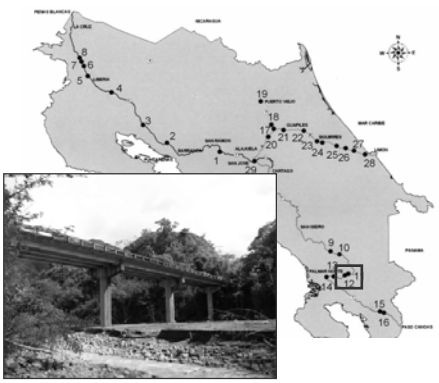
Sub: Rigid Frame

Foundation: Spread Foundations

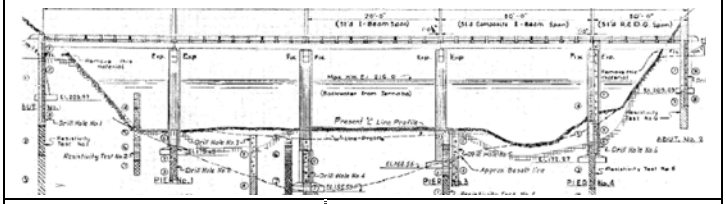


4. Bridge Location for Rio Puerto Nuevo Bridge (No.12)

Location : **Puntarenas Province**



Side View



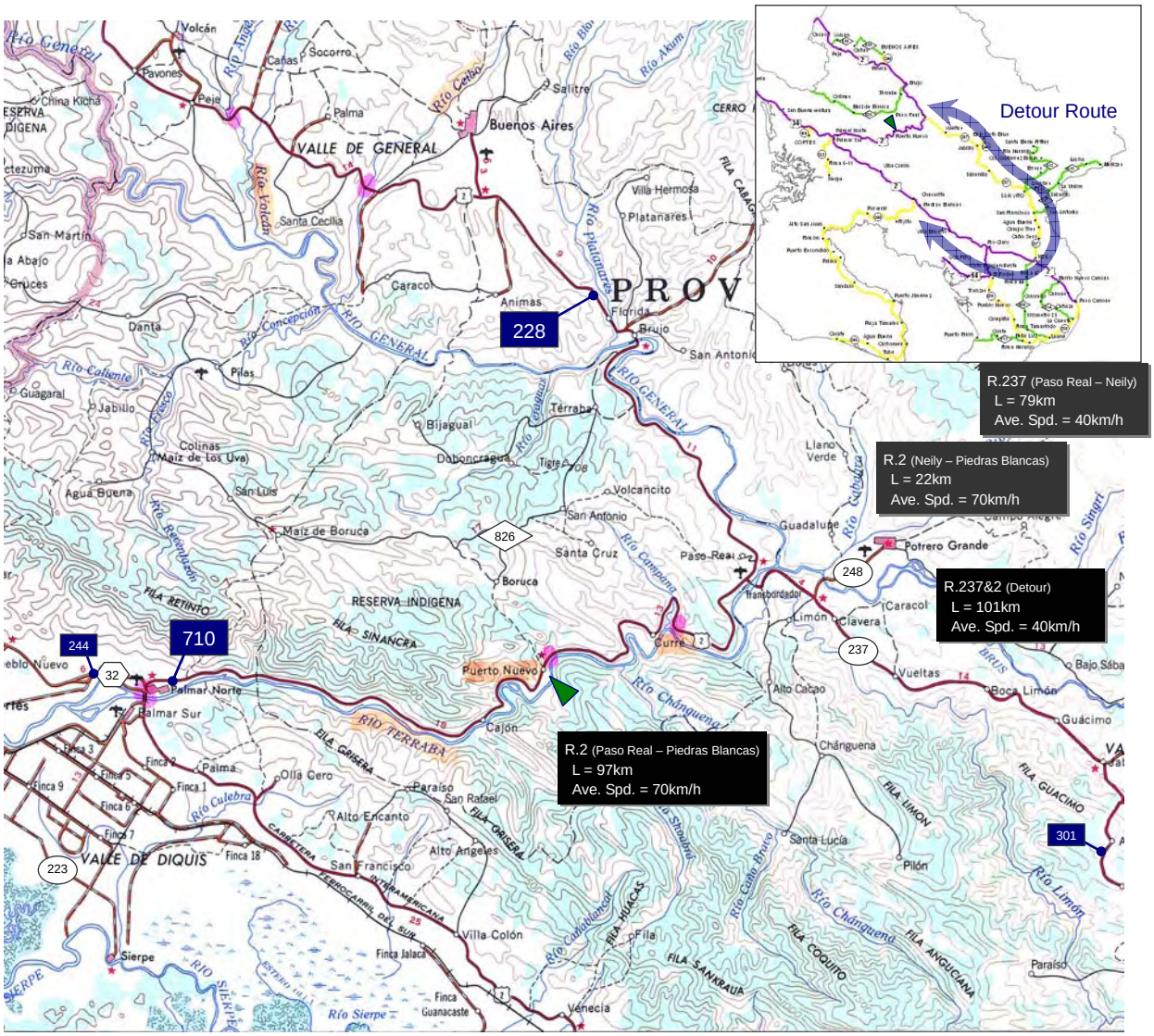
Design: 1958/01/10 | **Completion: 1961**

Length: 104.89m, Design Live Load: H15-S12-44

Sup: Steel Beam and Reinforced Concrete Girders

Sub: T Type Pier, Rigid Frame Abutment

Foundation: Spread Foundations



228

1999	1,565 TPD	-4.2%/year
2002	1,378 TPD	

710

1995	1,050 TPD	4.1%/year
1999	1,235 TPD	14.0%/year
2002	1,829 TPD	(8.3%/year)

244

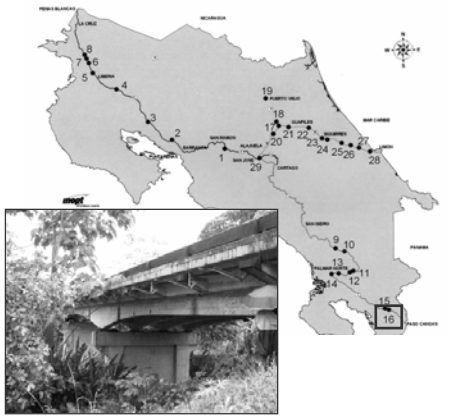
1999	1,165 TPD	23.1%/year
2002	2,176 TPD	

301

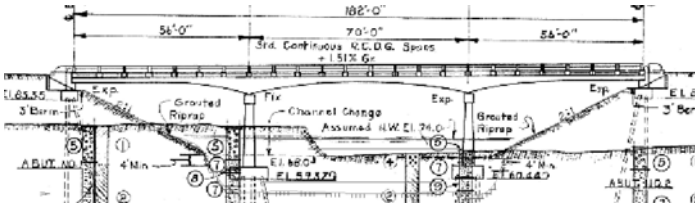
1998	340 TPD	-%/year
2002	- TPD	

5. Bridge Location for Rio Nuevo Bridge (No.16)

Location : **Puntarenas Province**

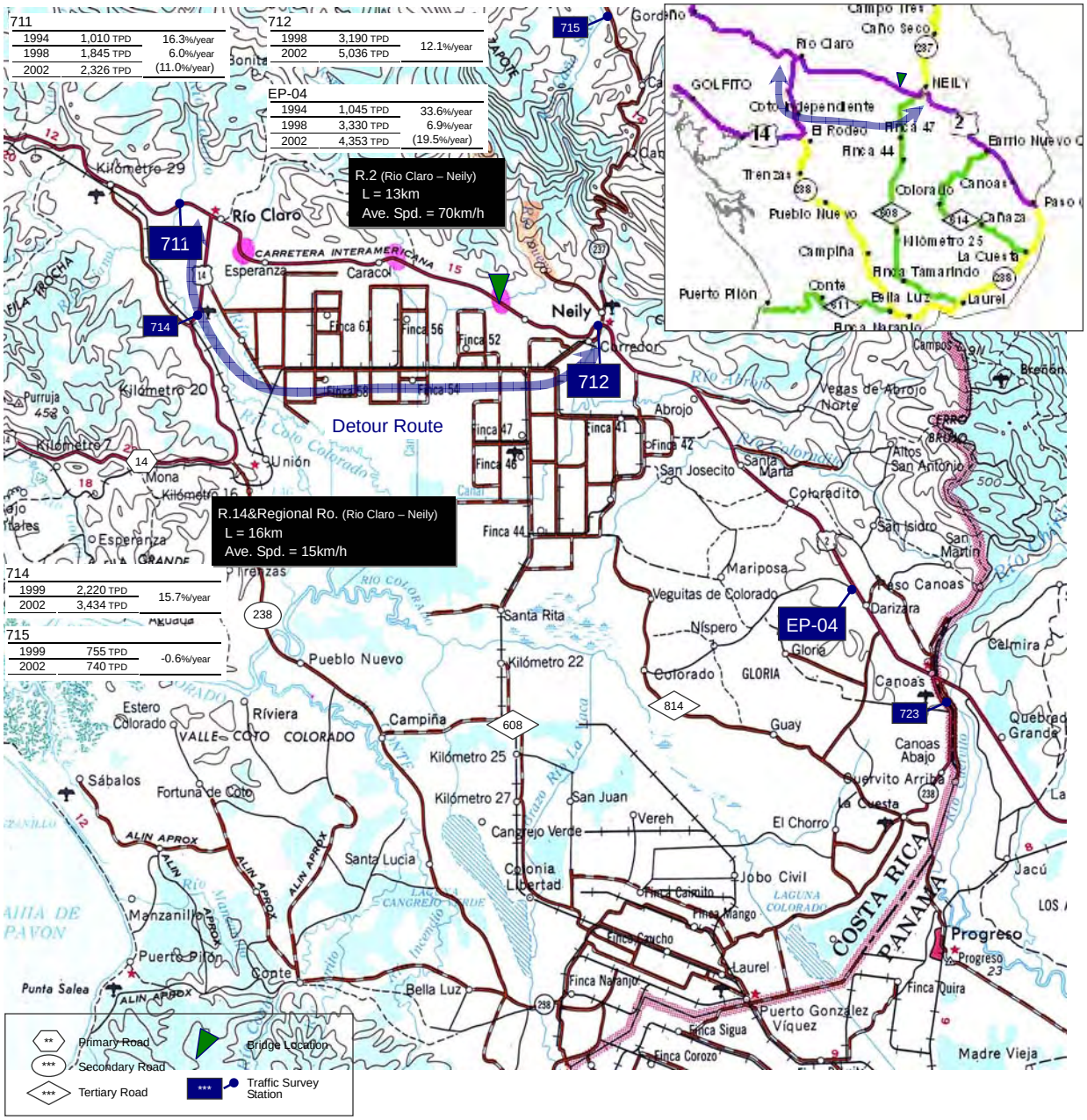


Side View



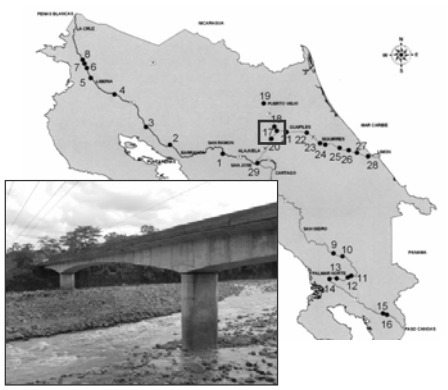
Design: 1957/12/19 | **Completion: 1961**

Length: 55.47m, Design Live Load: H15-S12-44
Sup: Continuous Reinforced Concrete Girder
Sub: Rigid Frame Pier, Reversed T Type Abutment
Foundation: Pile Foundations

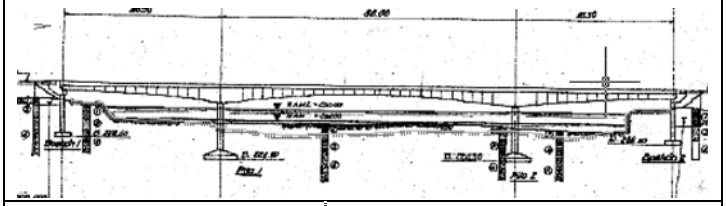


6. Bridge Location for Rio Chirripo Bridge (No.17)

Location : **Border Heredia & Limon Prov.**



Side View



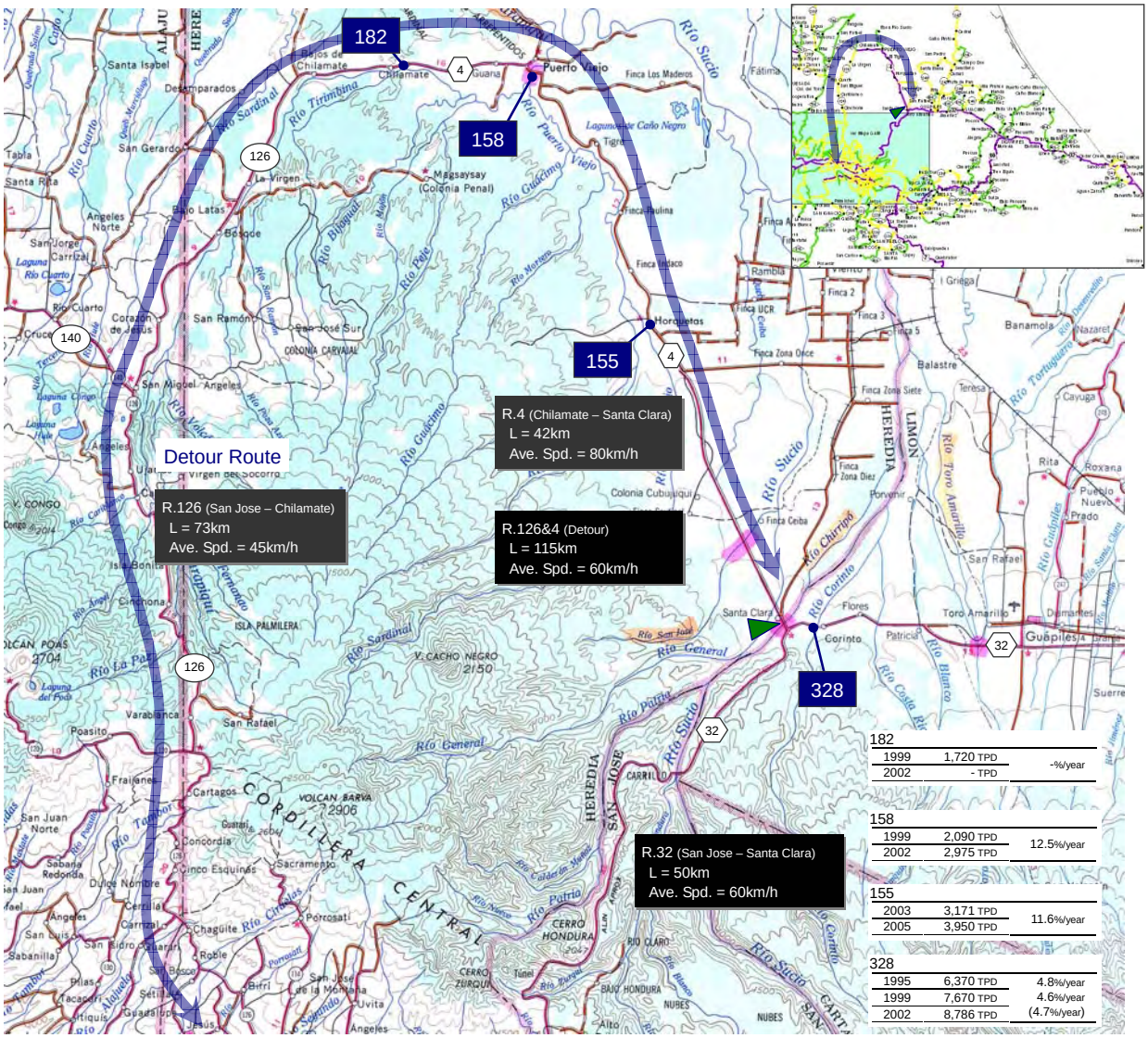
Design: 1975/03 | **Completion: 1978**

Length: 175.8m, Design Live Load: HS20-44

Sup: Concrete Box Girder

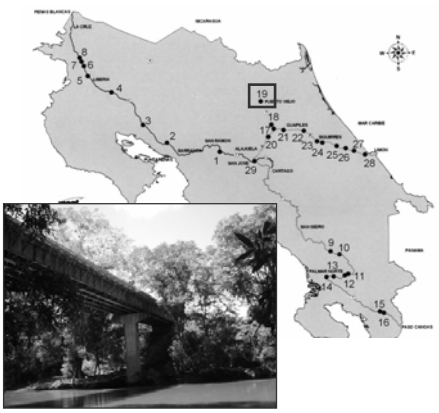
Sub: Wall Type Pier, Rigid Frame Abutment

Foundation: Spread Foundations

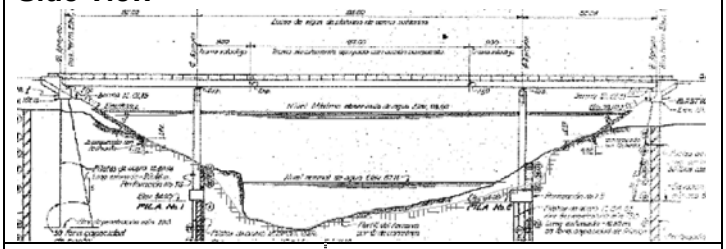


7. Bridge Location for Rio Sarapiqui Bridge (No.19)

Location : Heredia Province



Side View



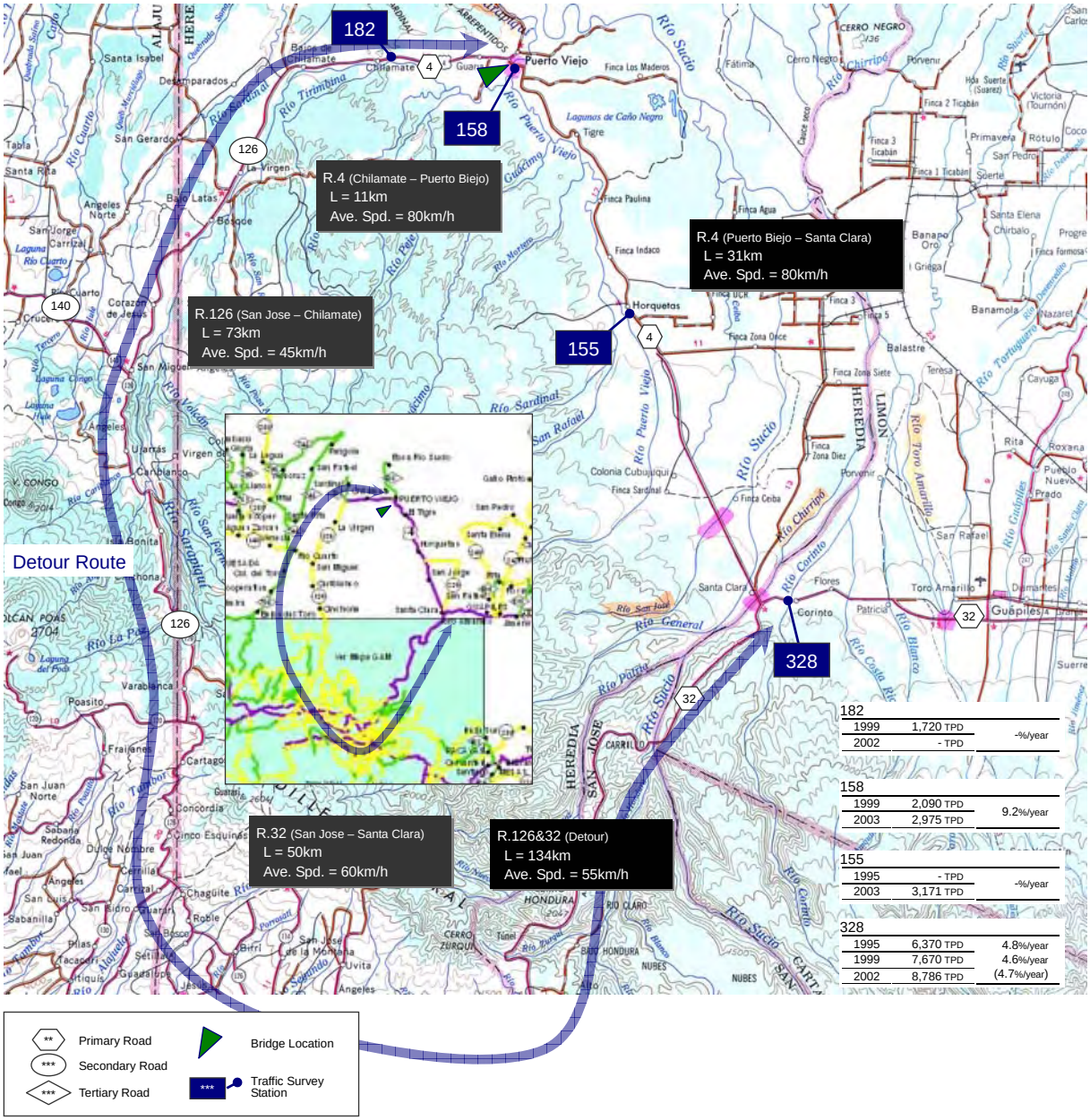
Design: 1970/12 | **Completion: 1978**

Length: 100.96m, Design Live Load: HS15-44

Sup: Steel I Beam

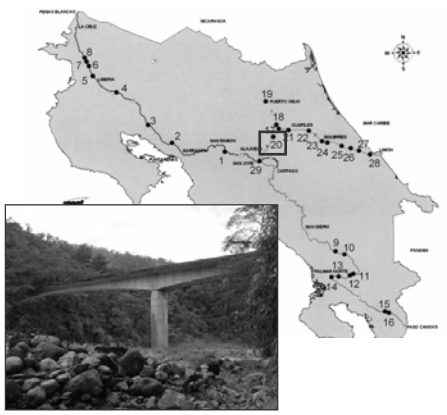
Sub: T Type Pier, Reversed T Type Abutment

Foundation: Pile Foundations

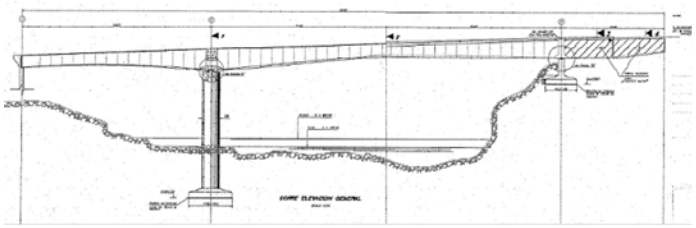


8. Bridge Location for Rio Sucio Bridge (No.20)

Location : Border San Jose, Cartago & Limon Prov.



Side View



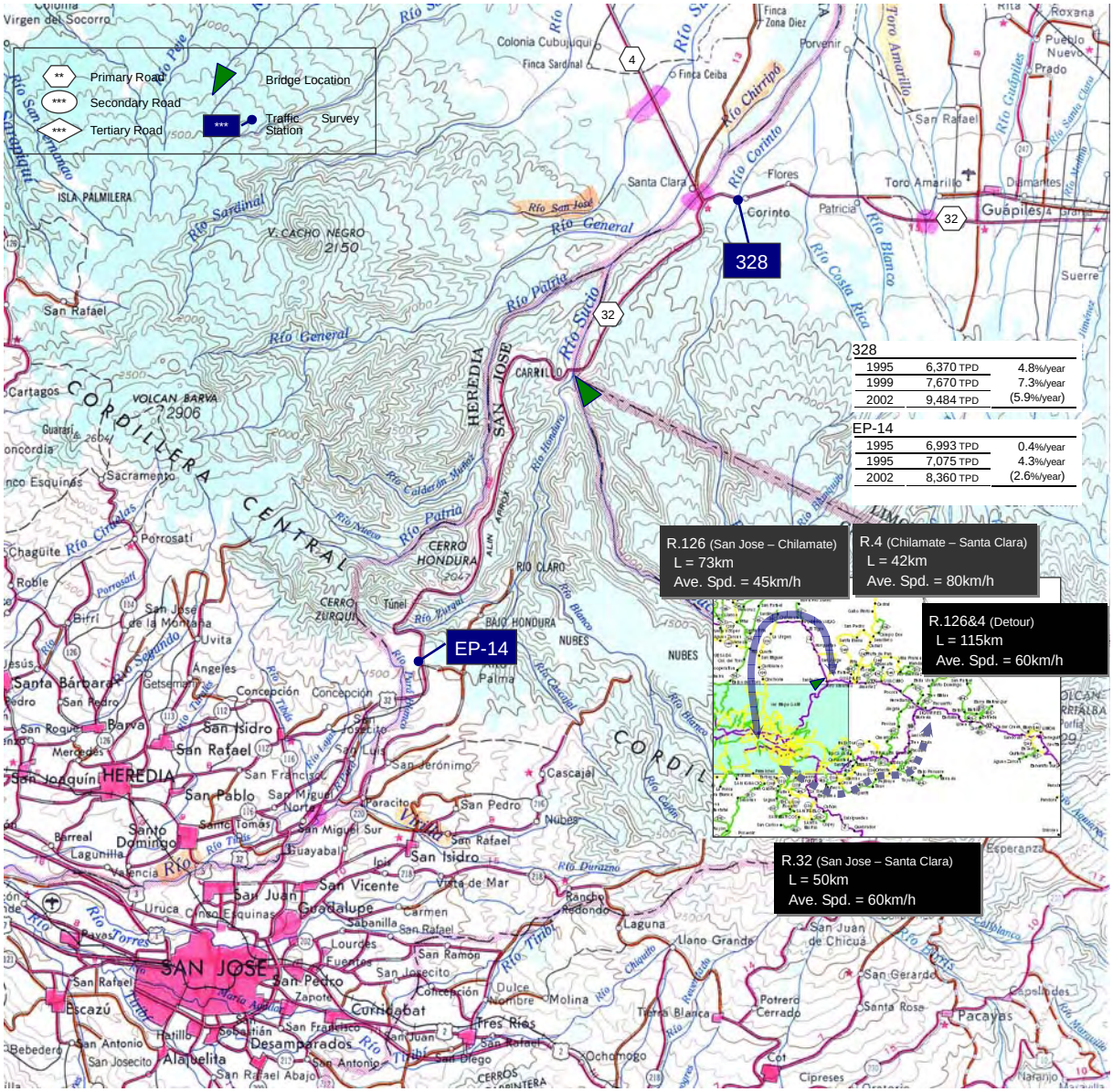
Design: N.D. | **Completion: N.D.**

Length: 187.25m, Design Live Load: HS-20

Sup: Concrete Box Girder

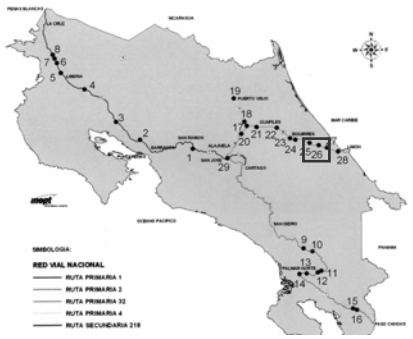
Sub: Circular Cylinder Pier, Rigid Frame Abutment

Foundation: Spread Foundations

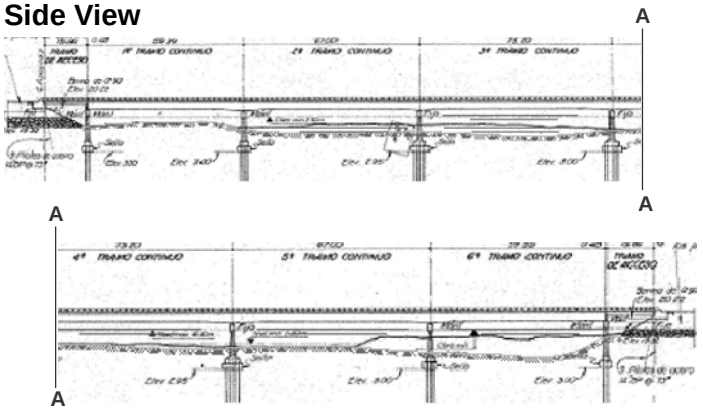


9. Bridge Location for Rio Chirripo Bridge (No.26)

Location : Limon Province



Side View



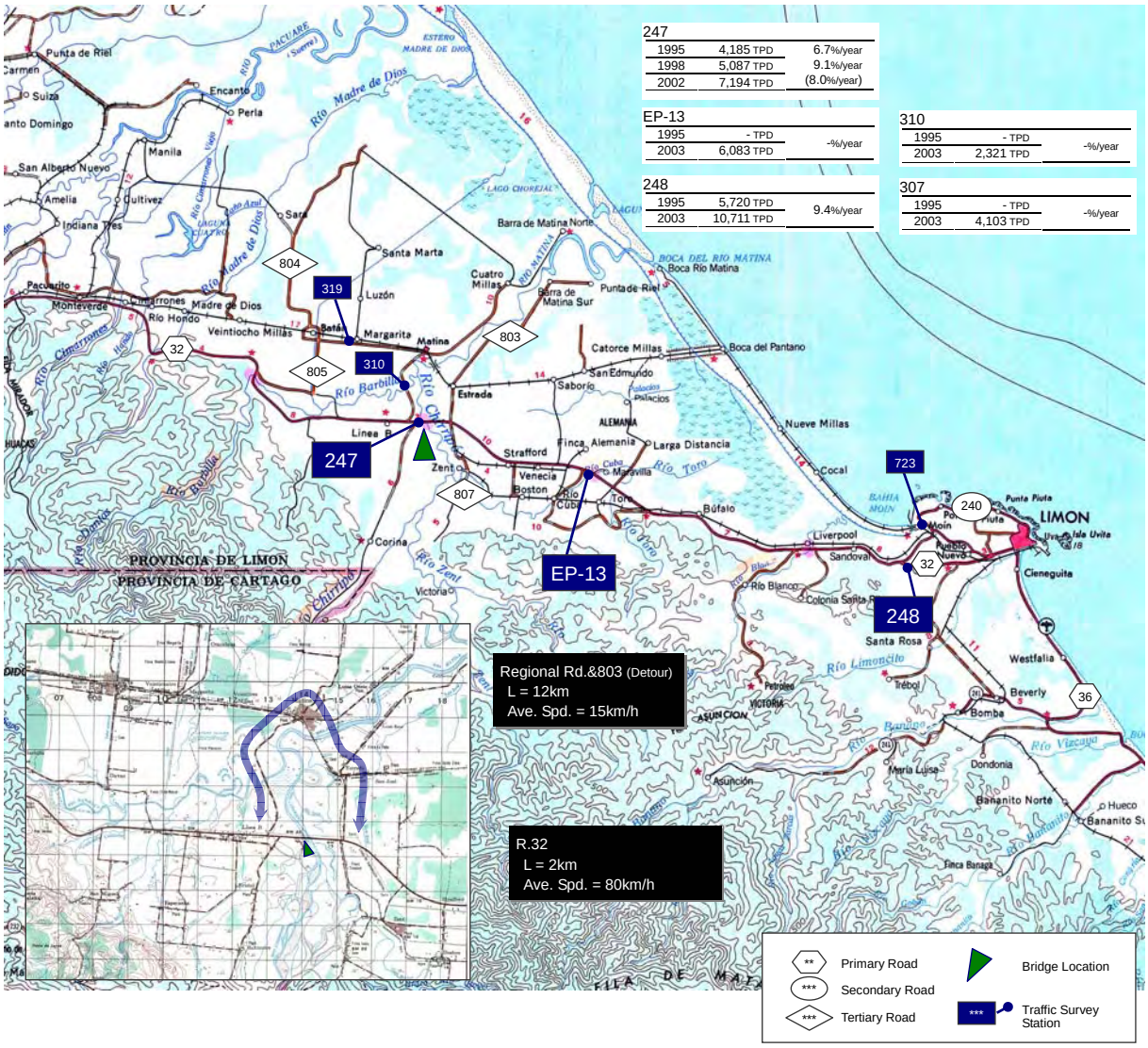
Design: 1969/07	**Completion: 1974-1978**

Length: 431.9m, Design Live Load: HS-20

Sup: Continuous Steel I Beam

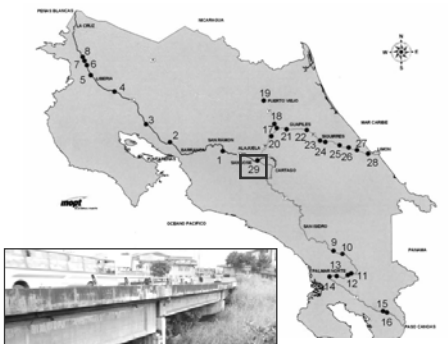
Sub: Wall Type Pier, Reversed T Type Abutment

Foundation: Pile Foundations

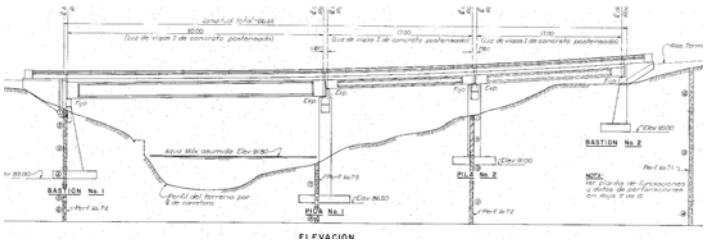


10. Bridge Location for Rio Torres Bridge (No.29)

Location : San Jose Province



Side View



Design: 1979/05/	**Completion: N.D.**

Length: 66.46m, Design Live Load: HS20-44

Sup: Concrete I Pos-tensioned Girder

Sub: T Type Pier, Rigid Frame Abutment

Foundation: Spread Foundations

4.4. SCENARIO FOR 10 SELECTED BRIDGE

No2 Puente Rio Aranjuez (R.1)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	Replacement (Precast Slab)
		Floor System	Stringer Addition & Rearrange meme
		Main Girder	Member Addition
			Expansion Joint (New Installation)
		Accessory	Flexible Railing Installation
			Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Concrete Block)
	Sub	Pier	Concrete Jacketing
			Footing Widening
		Foundation	Gabion Box Installation
			Wet Masonry
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / One lane / Not Necessary （24h） Total （100） Days		
Maintenance Plan	Inspection	Routine	every （ 5） years
		Detailed	every （10） years
	Super	Painting	every （10） years
		Repair for Floor System (Injection etc)	every （15） years
		Reinforcement for Floor System (FRP Bonding)	every （30） years
		Overlay of Pavement	every （ 7） years
		Replacement of Expansion Joint	every （15） years
		Asphalt Paving & Waterproofing	every （15） years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 10 years	Traffic Suspension 20 days 1-dir. Traffic Closure 100 days	Urgent Repair Work Slab Replacement
2	Main Girder	Deterioration of Paint & Corrosion →Lack of Cross Sectional Area	Within 20 years	Traffic Suspension 24 hrs.	Member Addition
3	Main Girder	Fatigue →Damaged Cracks around Connections	Within 30 years	Traffic Suspension 24 hrs	Member Addition
4	Pier	Earthquake →Damage at Pier	Within 30 years	1-dir. Traffic Closure 3 hrs. 7 days	Urgent Repair Work
5	Pier	Earthquake →Collapse of Pier & Bridge Falling Down	Within 50 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No3 Puente Rio Abangares (R.1)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	Replacement (Precast Slab)
		Floor System	Stringer Addition & Rearrange meme
		Main Girder	Diaphragm Rearrangement
			Cover Plate Fixing
			Expansion Joint (New Installation)
		Accessory	Flexible Railing Installation
			Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Chain Type)
	Sub	Pier	Concrete Jacketing
		Foundation	Footing Widening
			Gabion Box Installation
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	every（10）years
		Repair for Floor System (Injection etc)	every（15）years
		Reinforcement for Floor System (FRP Bonding)	every（30）years
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 10 years	Traffic Suspension 20 days 1-dir. Traffic Closure 100 days	Urgent Repair Work Slab Replacement
2	Main Girder	Deterioration of Paint & Corrosion →Lack of Cross Sectional Area	Within 20 years	Traffic Suspension 24 hrs.	Member Addition
3	Main Girder	Fatigue →Damaged Cracks around Connections	Within 30 years	Traffic Suspension 24 hrs	Member Addition
4	Pier	Earthquake →Damage at Pier	Within 30 years	1-dir. Traffic Closure 3 hrs. 7 days	Urgent Repair Work
5	Pier	Earthquake →Collapse of Pier & Bridge Falling Down	Within 50 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No7 Puente Rio Azufrado (R.1)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	Slab Thickness Increase
		Floor System	N/A
		Main Girder	Girder Height Increase
			Steel Plate Bonding
		Accessory	Expansion Joint (New Installation)
			Asphalt Paving & Water Proofing
		Prevention System	N/A
	Sub	Pier	Concrete Jacketing
		Foundation	Footing Widening
		Prevention System	N/A
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	N/A
		Repair for Floor System (Injection etc)	every（15）years
		Reinforcement for Floor System (FRP Bonding)	N/A
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	N/A
		Asphalt Paving & Waterproofing	every（15）years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab	Holes → Not Passable for 1-lane	Within 10 years	1-dir. Traffic Closure 10 days	Urgent Repair Work
2	Main Girder	Increase of Deficiency → Not Passable	Within 20 years	Traffic Suspension 30 days	Bailey Bridge Const. Reinforcement of Main Girder

No12 Puente Rió Puerto Nuevo (R.2)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	FRP Bonding
		Floor System	N/A
		Main Girder	Prestressing (Out Cable)
			Steel Plate Bonding
		Accessory	Expansion Joint (New Installation)
			Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Chain Type)
	Sub	Pier	Height of Transversal Beam Increase
		Foundation	Footing Widening
			Wet Masonry
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / [One lane] / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（ 5）years
		Detailed	every（10）years
	Super	Painting	every（10）years
		Repair for Floor System (Injection etc)	N/A
		Reinforcement for Floor System (FRP Bonding)	every（30）years
		Overlay of Pavement	every（ 7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 15 years	Traffic Suspension 30 days	Bailey Bridge Const. Slab Replacement
2	Main Girder	Deterioration of Paint & Corrosion →Lack of Cross Sectional Area	Within 20 years	1-dir. Traffic Closure 3 hrs. 7 days	Reinforcement of Main Girder
3	Main Girder	Fatigue →Damaged Cracks around Connections	Within 30 years	Traffic Suspension 24 hrs 1-dir. Traffic Closure 3 hrs. 7 days	Reinforcement of Main Girder
4	Pier	Earthquake →Collapse of Pier & Bridge Falling Down	Within 50 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No16 Puente Río Nuevo (R.2)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	Slab Thickness Increase
		Floor System	N/A
		Main Girder	FRP Bonding
			Reconstruction of Cross Beam
		Accessory	Expansion Joint (New Installation)
			Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Concrete Block)
	Sub	Pier	Concrete Jacketing
		Foundation	Footing Widening
			Additional Pile Installation
			Gabion Box Installation
			Wet Masonry
		Prevention System	Bridge Seat Widening (Abutment)
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	N/A
		Repair for Floor System (Injection etc)	every（15）years
		Reinforcement for Floor System (FRP Bonding)	N/A
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	Gabion	every（10）years

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Hole → Not Passable for 1-dir lane	Within 10 years	1-dir. Traffic Closure 100 days	Urgent Repair
2	Main Girder	Increase of Deficiency → Not Passable	Within 20 years	Traffic Suspension 24 hrs.	Bailey Bridge Const. Steel Plate Bonding
3	Foundation	Scouring →Buckling	Within 10 years	Traffic Suspension 10 days	Bailey Bridge Const. Re-Construction
4	Foundation	Earthquake → Damage of Foundation & Bridge Falling Down	Within 30 years	Traffic Suspension 10 days	Bailey Bridge Const. Re-Construction

No17 Puente Rio Chirripo (R.4)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	N/A
		Floor System	N/A
		Main Girder	N/A
			Expansion Joint (Replacement)
		Accessory	N/A
			Asphalt Paving & Water Proofing
		Prevention System	N/A
		Pier	Rolling Stone Protection
	Sub	Foundation	Footing Widening
		Prevention System	N/A
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	N/A
		Repair for Floor System (Injection etc)	every（15）years
		Reinforcement for Floor System (FRP Bonding)	N/A
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	Pier Protection	every（15）years

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab	Increase of Deficiency → Not Passable	Within 30 years	Traffic Suspension 30 days	Bailey Bridge Const. Reinforcement of Main Girder
2	Pier	Decrease of Cross Sectional Area → Decrease of Resistance for Earthquake (20 years after) → Earthquake →Collapse of Pier & Bridge Falling Down	Within 50 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No19 Puente Rio Sarapiqui (R.4)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	FRP Bonding
		Floor System	N/A
		Main Girder	PC Canle Steel Plate Bonding Steel Plate Replacement
		Accessory	Expansion Joint (New Installation) Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Chain Type)
	Sub	Pier	Height of Transversal Beam Increase
		Foundation	Additional Pile Installation Footing Widening
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	every（10）years
		Repair for Floor System (Injection etc)	N/A
		Reinforcement for Floor System (FRP Bonding)	every（30）years
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab	Increase of Deficiency → Not Passable	Within 15 years	Traffic Suspension 30 days	Urgent Repair Work Slab Replacement
2	Main Girder	Deterioration of Paint & Corrosion →Lack of Cross Sectional Area	Within 10 years	Traffic Suspension 3 hrs, 7 days.	Steel Plate Replacement
3	Main Girder	Fatigue →Damaged Cracks around Connections	Within 30 years	Traffic Suspension 24 hrs Traffic Suspension 3 hrs, 14 days.	Steel Plate Replacement
4	Pier	Earthquake →Collapse of Pier & Bridge Falling Down	Within 30 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No20 Puente Rio Sucio (R.32)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	N/A
		Floor System	N/A
		Main Girder	N/A
			Expansion Joint (Replacement)
		Accessory	N/A
			Asphalt Paving & Water Proofing
		Prevention System	N/A
	Sub	Pier	Rolling Stone Protection
		Foundation	N/A
		Prevention System	N/A
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	N/A
		Repair for Floor System (Injection etc)	N/A
		Reinforcement for Floor System (FRP Bonding)	N/A
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	Pier Protection	every（15）years

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 30 years	Traffic Suspension 30 days	Bailey Bridge Const. Slab Replacement
2	Pier	Decrease of Cross Sectional Area → Decrease of Resistance for Earthquake → Earthquake →Collapse of Pier & Bridge Falling Down	Within 50 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No26 Puente Rio Chirripo (R.32)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	FRP Bonding
		Floor System	N/A
		Main Girder	N/A
		Accessory	Expansion Joint (New Installation)
			Asphalt Paving & Water Proofing
		Prevention System	Girder Connection (Chain Type)
	Sub	Pier	Height of Transversal Beam Installation
		Foundation	Footing Widening
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	N/A
		Repair for Floor System (Injection etc)	every（15）years
		Reinforcement for Floor System (FRP Bonding)	N/A
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	Pier Protection	every（15）years

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 15 years	Traffic Suspension 30 days	Bailey Bridge Const. Slab Replacement
2	Main Girder	Deterioration of Paint & Corrosion →Lack of Cross Sectional Area	Within 20 years	1-dir. Traffic Closure 3 hrs. 7 days	Steel Plate Replacement
3	Main Girder	Fatigue →Damaged Cracks around Connections	Within 30 years	Traffic Suspension 24 hrs 1-dir. Traffic Closure 3 hrs. 14 days	Cover Plate Fixing
4	Pier	Earthquake → Falling Down at Main Girder of Side Span	Within 30 years	Traffic Suspension 30 days	Bailey Bridge Const. Re-Construction

No29 Puente Rio Torres (R.218)

With Case *in the case of implemented Rehabilitation & Reinforcement*

Contents of Rehabilitation & Reinforcement	Super	Slab Deck:	Slab Thickness Increase
		Floor System	N/A
		Main Girder	FRP Bonding
			Expansion Joint (New Installation)
		Accessory	N/A
			Asphalt Paving & Water Proofing
		Prevention System	N/A
	Sub	Pier	Concrete Jacketing
			Height of Transversal Beam Increase
		Foundation	Footing Widening
			Gabion Box Installation
		Prevention System	Bridge Seat Widening (Abutment & Pier)
Traffic Control	Both lane / One lane / Not Necessary （24h）Total（100）Days		
Maintenance Plan	Inspection	Routine	every（5）years
		Detailed	every（10）years
	Super	Painting	every（10）years
		Repair for Floor System (Injection etc)	N/A
		Reinforcement for Floor System (FRP Bonding)	every（30）years
		Overlay of Pavement	every（7）years
		Replacement of Expansion Joint	every（15）years
		Asphalt Paving & Waterproofing	every（15）years
	Sub	N/A	N/A

Without Case *in the case of NOT implemented Rehabilitation & Reinforcement*

Scenario

No.	Occurrence Part	Results	year	Social Effect	Emergency & Rehabilitation Work
1	Deck Slab Floor System	Increase of Deficiency → Not Passable	Within 20 years	Traffic Suspension 30 days Detour to another route	FRP/Steel Plate Bonding
2	Pier	Earthquake → Bridge Falling Down	Within 30 years	Traffic Suspension 100 days Detour to another route	Re-Construction

4.5. RESULTS OF WORK COSTS FOR 10 SELECTED BRIDGE

Unit: USD including Tax

			Items	No2	No3	No7	No12	No16
Work Costs for "With case"			Project Cost	1,291,336	1,371,664	432,352	1,371,182	661,336
	Maintenance	Inspection	Periodic	*	*	*	*	*
			Detail	*	*	*	*	*
		Sup. - St.	Re-Painting	89,360	103,164		106,778	
			Repair for Floor System (Injection)	9,024	10,418	3,227		5,702
			FRP Bounding	135,510	156,444		161,924	
			Overlay of Pavement	8,401	9,698	3,004	10,038	5,308
			Expansion Joint Replacement	45,570	34,178		68,355	45,570
			Asphalt Paving	10,095	11,654	3,610	12,062	6,379
			Water Proofing	92,432	106,711	33,054	110,449	58,410
		Sub - St.	Rolling Stone Protection					
			Protection for Scouring (Gabion)					23,018
Work Costs for "Without case"	Emergency Recovery	Deck Slab Floor System	Emergency Repair	184,338	319,221	4,500	132,161	1,500
			Slab Replacement	473,630	456,857		631,480	
		Main Girder	Member Addition	66,715	26,506	120,927		78,940
			Reinforcement				9,162	
		Pier	Urgent Repair Work	48,495	48,495			
		Bailey Bridge	Preparation & Construction	553,014	638,442	197,757	660,807	349,461
		Re-construction		3,511,200	4,053,600		4,195,600	2,218,800

			Items	No17	No19	No20	No26	No29
Work Costs for "With case"			Project Cost *1	485,436	1,107,777	359,984	3,270,323	557,085
	Maintenance	Inspection	Periodic	*	*	*	*	*
			Detail	*	*	*	*	*
		Sup.- St.	Re-Painting		102,716			67,595
			Repair for Floor System (Injection)	18,072			44,399	
			FRP Bounding		155,716			102,505
			Overlay of Pavement	16,824	9,656	17,920	41,333	6,354
			Expansion Joint Replacement	45,570	45,570	34,178	102,533	45,570
			Asphalt Paving	20,217	11,604	21,534	49,699	7,636
			Water Proofing	185,117	106,248	197,174	454,791	69,919
		Sub - St.	Rolling Stone Protection	40,000				
			Protection for Scouring (Gabion)			48,000		
Work Costs for "Without case"	Emergency Recovery	Deck Slab Floor System	Emergency Repair					
			Slab replacement		607,458	1,127,320	2,600,211	
		Main Girder	Member Addition Reinforcement	391,688	261,125		1,117,739	212,306
							9,162	
		Pier	Urgent Repair Work					
		Bailey Bridge	Preparation & Construction	1,107,540	635,670	1,179,675,	2,720,970	
		Re-construction		7,032,000	4,036,000	7,490,000	17,276,000	2,656,000

Note: "Project Costs" listed herein the table are duly bound with Chapter 12 as well as Appendix 3.: Construction Planning and Cost Estimate.

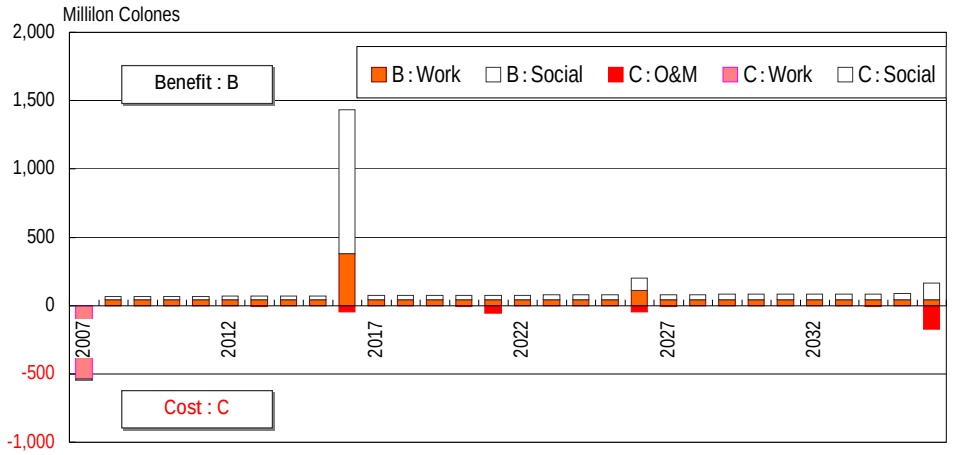
4.6. EIRR & NPV AT 12% FOR 10 SELECTED BRIDGE

No2 Puente Rio Aranjuez (R.1)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	535,151,502		10,281,282	545,432,784				-545,432,784
2	2008				0	41,927,670	23,957,589	65,885,259	65,885,259
3	2009				0	41,927,670	24,726,747	66,654,417	66,654,417
4	2010				0	41,927,670	25,495,905	67,423,575	67,423,575
5	2011		31,000		31,000	41,927,670	26,265,063	68,192,733	68,161,733
6	2012				0	41,927,670	27,034,221	68,961,891	68,961,891
7	2013		5,206,846		5,206,846	41,927,670	27,803,379	69,731,050	64,524,203
8	2014				0	41,927,670	28,572,537	70,500,208	70,500,208
9	2015				0	41,927,670	29,341,696	71,269,366	71,269,366
10	2016		46,259,909		46,259,909	381,307,565	1,050,038,079	1,431,345,644	1,385,085,735
11	2017				0	41,927,670	30,880,012	72,807,683	72,807,683
12	2018				0	41,927,670	31,649,171	73,576,841	73,576,841
13	2019				0	41,927,670	32,418,329	74,346,000	74,346,000
14	2020		5,206,846		5,206,846	41,927,670	33,187,488	75,115,159	69,908,312
15	2021		57,568,915		57,568,915	41,927,670	33,956,647	75,884,317	18,315,402
16	2022				0	41,927,670	34,725,806	76,653,476	76,653,476
17	2023				0	41,927,670	35,494,964	77,422,635	77,422,635
18	2024				0	41,927,670	36,264,123	78,191,794	78,191,794
19	2025				0	41,927,670	37,033,282	78,960,953	78,960,953
20	2026		46,259,909		46,259,909	110,750,864	91,827,280	202,578,144	156,318,236
21	2027		5,206,846		5,206,846	41,927,670	38,571,600	80,499,271	75,292,425
22	2028				0	41,927,670	39,340,760	81,268,430	81,268,430
23	2029				0	41,927,670	40,109,919	82,037,589	82,037,589
24	2030				0	41,927,670	40,879,078	82,806,749	82,806,749
25	2031		31,000		31,000	41,927,670	41,648,237	83,575,908	83,544,908
26	2032				0	41,927,670	42,417,397	84,345,067	84,345,067
27	2033				0	41,927,670	43,186,556	85,114,227	85,114,227
28	2034		5,206,846		5,206,846	41,927,670	43,955,716	85,883,387	80,676,540
29	2035				0	41,927,670	44,724,876	86,652,546	86,652,546
30	2036		173,694,075		173,694,075	41,927,670	121,315,783	163,243,453	-10,450,622

EIRR = 21.5%

NPV at 12% = 489,869,123 Colones

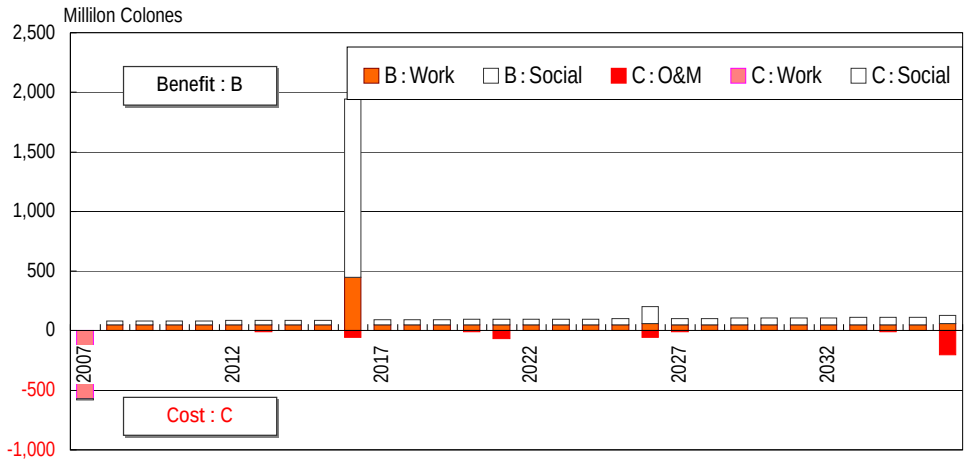


No3 Puente Rio Abangares (R.1)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	568,440,785		9,640,330	578,081,115				-578,081,115
2	2008				0	48,404,344	31,239,379	79,643,723	79,643,723
3	2009				0	48,404,344	32,460,538	80,864,882	80,864,882
4	2010				0	48,404,344	33,681,698	82,086,042	82,086,042
5	2011		31,000		31,000	48,404,344	34,902,857	83,307,201	83,276,201
6	2012				0	48,404,344	36,124,016	84,528,361	84,528,361
7	2013		6,011,185		6,011,185	48,404,344	37,345,176	85,749,520	79,738,335
8	2014				0	48,404,344	38,566,336	86,970,680	86,970,680
9	2015				0	48,404,344	39,787,495	88,191,839	88,191,839
10	2016		53,380,053		53,380,053	448,705,377	1,492,883,623	1,941,588,999	1,888,208,946
11	2017				0	48,404,344	42,229,815	90,634,159	90,634,159
12	2018				0	48,404,344	43,450,975	91,855,319	91,855,319
13	2019				0	48,404,344	44,672,135	93,076,479	93,076,479
14	2020		6,011,185		6,011,185	48,404,344	45,893,295	94,297,639	88,286,454
15	2021		66,457,205		66,457,205	48,404,344	47,114,455	95,518,799	29,061,594
16	2022				0	48,404,344	48,335,616	96,739,960	96,739,960
17	2023				0	48,404,344	49,556,776	97,961,120	97,961,120
18	2024				0	48,404,344	50,777,937	99,182,281	99,182,281
19	2025				0	48,404,344	51,999,097	100,403,441	100,403,441
20	2026		53,380,053		53,380,053	62,076,139	141,919,285	203,995,424	150,615,371
21	2027		6,011,185		6,011,185	48,404,344	54,441,419	102,845,763	96,834,578
22	2028				0	48,404,344	55,662,580	104,066,924	104,066,924
23	2029				0	48,404,344	56,883,741	105,288,085	105,288,085
24	2030				0	48,404,344	58,104,902	106,509,246	106,509,246
25	2031		31,000		31,000	48,404,344	59,326,063	107,730,407	107,699,407
26	2032				0	48,404,344	60,547,225	108,951,569	108,951,569
27	2033				0	48,404,344	61,768,386	110,172,730	110,172,730
28	2034		6,011,185		6,011,185	48,404,344	62,989,548	111,393,892	105,382,707
29	2035				0	48,404,344	64,210,709	112,615,053	112,615,053
30	2036		200,499,880		200,499,880	62,076,139	65,431,871	127,508,010	-72,991,870

EIRR = 24.9%

NPV at 12% = 759,825,081 Colones

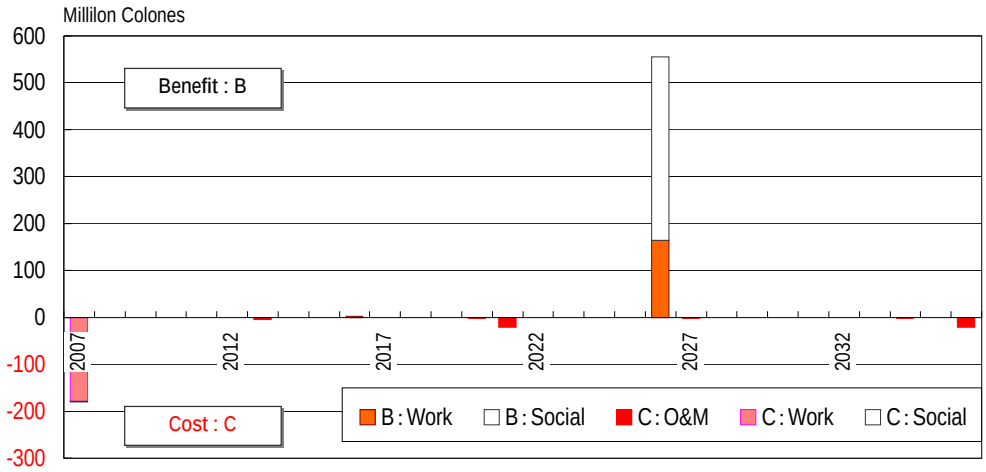


No7 Puente Rio Azufrado (R.1)

	year	Costs			Total Cost	Benefits		Total Benefit	Results
		Work		Social		Work	Social		
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	Net Benefit (B-A)
1	2007	179,173,989		1,677,388	180,851,377				-180,851,377
2	2008				0	0	0	0	0
3	2009				0	0	0	0	0
4	2010				0	0	0	0	0
5	2011		31,000		31,000	0	0	0	-31,000
6	2012				0	0	0	0	0
7	2013		5,206,846		5,206,846	0	0	0	-5,206,846
8	2014				0	0	0	0	0
9	2015				0	0	0	0	0
10	2016		168,000		168,000	2,321,100	172,073	2,493,173	2,325,173
11	2017				0	0	0	0	0
12	2018				0	0	0	0	0
13	2019				0	0	0	0	0
14	2020		1,861,961		1,861,961	0	0	0	-1,861,961
15	2021		20,606,475		20,606,475	0	0	0	-20,606,475
16	2022				0	0	0	0	0
17	2023				0	0	0	0	0
18	2024				0	0	0	0	0
19	2025				0	0	0	0	0
20	2026		168,000		168,000	164,377,207	390,113,877	554,491,084	554,323,084
21	2027		1,861,961		1,861,961	0	0	0	-1,861,961
22	2028				0	0	0	0	0
23	2029				0	0	0	0	0
24	2030				0	0	0	0	0
25	2031		31,000		31,000	0	0	0	-31,000
26	2032				0	0	0	0	0
27	2033				0	0	0	0	0
28	2034		1,861,961		1,861,961	0	0	0	-1,861,961
29	2035				0	0	0	0	0
30	2036		20,743,475		20,743,475	0	0	0	-20,743,475

EIRR = 5.5%

-124,010,926 Colones

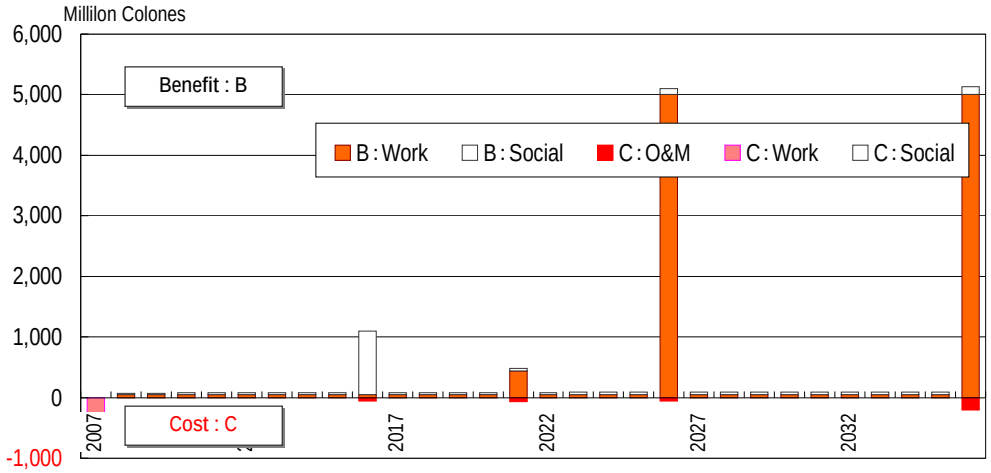


No12 Puente Rió Puerto Nuevo (R.2)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	568,241,036		1,372,497	569,613,533				-569,613,533
2	2008				0	50,098,695	23,957,589	74,056,284	74,056,284
3	2009				0	50,098,695	24,726,747	74,825,441	74,825,441
4	2010				0	50,098,695	25,495,905	75,594,599	75,594,599
5	2011		31,000		31,000	50,098,695	26,265,063	76,363,757	76,332,757
6	2012				0	50,098,695	27,034,221	77,132,916	77,132,916
7	2013		6,221,760		6,221,760	50,098,695	27,803,379	77,902,074	71,680,314
8	2014				0	50,098,695	28,572,537	78,671,232	78,671,232
9	2015				0	50,098,695	29,341,696	79,440,390	79,440,390
10	2016		55,244,103		55,244,103	50,098,695	1,050,038,079	1,100,136,773	1,044,892,671
11	2017				0	50,098,695	30,880,012	80,978,707	80,978,707
12	2018				0	50,098,695	31,649,171	81,747,866	81,747,866
13	2019				0	50,098,695	32,418,329	82,517,024	82,517,024
14	2020		6,221,760		6,221,760	50,098,695	33,187,488	83,286,183	77,064,423
15	2021		63,222,442		63,222,442	443,984,803	33,956,647	477,941,450	414,719,008
16	2022				0	50,098,695	34,725,806	84,824,500	84,824,500
17	2023				0	50,098,695	35,494,964	85,593,659	85,593,659
18	2024				0	50,098,695	36,264,123	86,362,818	86,362,818
19	2025				0	50,098,695	37,033,282	87,131,977	87,131,977
20	2026		55,244,103		55,244,103	5,007,099,425	91,827,280	5,098,926,705	5,043,682,603
21	2027		6,221,760		6,221,760	50,098,695	38,571,600	88,670,295	82,448,535
22	2028				0	50,098,695	39,340,760	89,439,454	89,439,454
23	2029				0	50,098,695	40,109,919	90,208,613	90,208,613
24	2030				0	50,098,695	40,879,078	90,977,773	90,977,773
25	2031		31,000		31,000	50,098,695	41,648,237	91,746,932	91,715,932
26	2032				0	50,098,695	42,417,397	92,516,092	92,516,092
27	2033				0	50,098,695	43,186,556	93,285,251	93,285,251
28	2034		6,221,760		6,221,760	50,098,695	43,955,716	94,054,411	87,832,651
29	2035				0	50,098,695	44,724,876	94,823,570	94,823,570
30	2036		201,955,912		201,955,912	5,007,099,425	121,315,783	5,128,415,208	4,926,459,297

EIRR = 23.9%

NPV at 12% = 1,234,911,469 Colones

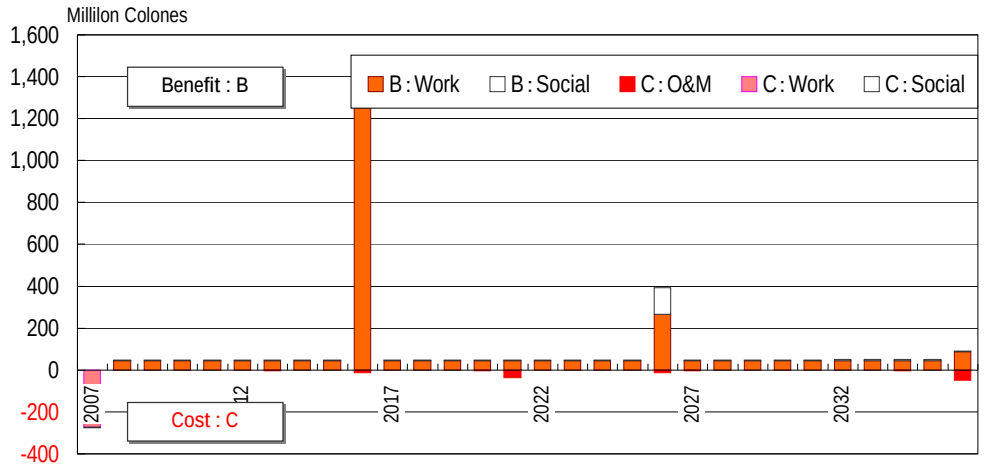


No16 Puente Río Nuevo (R.2)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	274,068,835		2,277,205	276,346,040				-276,346,040
2	2008				0	44,156,967	2,773,224	46,930,191	46,930,191
3	2009				0	44,156,967	2,876,174	47,033,141	47,033,141
4	2010				0	44,156,967	2,979,124	47,136,092	47,136,092
5	2011		31,000		31,000	44,156,967	3,082,075	47,239,042	47,208,042
6	2012				0	44,156,967	3,185,025	47,341,992	47,341,992
7	2013		3,290,314		3,290,314	44,156,967	3,287,975	47,444,943	44,154,629
8	2014				0	44,156,967	3,390,925	47,547,893	47,547,893
9	2015				0	44,156,967	3,493,876	47,650,843	47,650,843
10	2016		12,040,684		12,040,684	1,369,639,691	111,823,075	1,481,462,766	1,469,422,082
11	2017				0	44,156,967	3,699,776	47,856,744	47,856,744
12	2018				0	44,156,967	3,802,727	47,959,694	47,959,694
13	2019				0	44,156,967	3,905,677	48,062,644	48,062,644
14	2020		3,290,314		3,290,314	44,156,967	4,008,627	48,165,595	44,875,281
15	2021		36,390,400		36,390,400	44,156,967	4,111,577	48,268,545	11,878,145
16	2022				0	44,156,967	4,214,528	48,371,495	48,371,495
17	2023				0	44,156,967	4,317,478	48,474,445	48,474,445
18	2024				0	44,156,967	4,420,428	48,577,396	48,577,396
19	2025				0	44,156,967	4,523,379	48,680,346	48,680,346
20	2026		12,040,684		12,040,684	265,126,203	126,823,720	391,949,923	379,909,238
21	2027		3,290,314		3,290,314	44,156,967	4,729,279	48,886,247	45,595,933
22	2028				0	44,156,967	4,832,229	48,989,197	48,989,197
23	2029				0	44,156,967	4,935,180	49,092,147	49,092,147
24	2030				0	44,156,967	5,038,130	49,195,098	49,195,098
25	2031		31,000		31,000	44,156,967	5,141,080	49,298,048	49,267,048
26	2032				0	44,156,967	5,244,031	49,400,998	49,400,998
27	2033				0	44,156,967	5,346,981	49,503,948	49,503,948
28	2034		3,290,314		3,290,314	44,156,967	5,449,931	49,606,899	46,316,585
29	2035				0	44,156,967	5,552,882	49,709,849	49,709,849
30	2036		48,400,085		48,400,085	85,647,919	5,655,832	91,303,751	42,903,667

EIRR = 31.1%

NPV at 12% = 646,541,983 Colones

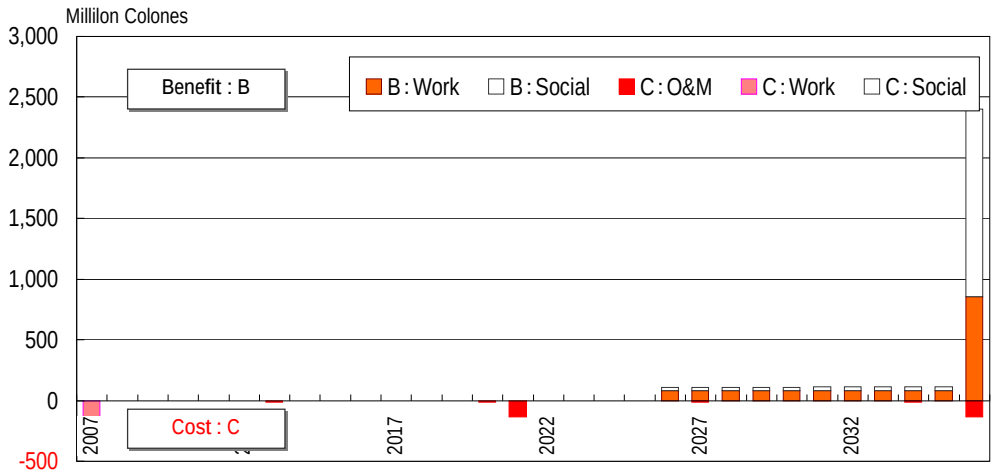


No17 Puente Rio Chirripo (R.4)

	year	Costs			Total Cost	Benefits		Total Benefit	Results
		Work		Social		Work	Social		
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	Net Benefit (B-A)
1	2007	201,172,897		3,804,158	204,977,055				-204,977,055
2	2008				0	0	0	0	0
3	2009				0	0	0	0	0
4	2010				0	0	0	0	0
5	2011		31,000		31,000	0	0	0	-31,000
6	2012				0	0	0	0	0
7	2013		10,427,929		10,427,929	0	0	0	-10,427,929
8	2014				0	0	0	0	0
9	2015				0	0	0	0	0
10	2016		168,000		168,000	0	0	0	-168,000
11	2017				0	0	0	0	0
12	2018				0	0	0	0	0
13	2019				0	0	0	0	0
14	2020		10,427,929		10,427,929	0	0	0	-10,427,929
15	2021		135,896,145		135,896,145	0	0	0	-135,896,145
16	2022				0	0	0	0	0
17	2023				0	0	0	0	0
18	2024				0	0	0	0	0
19	2025				0	0	0	0	0
20	2026		168,000		168,000	83,967,495	24,979,901	108,947,396	108,779,396
21	2027		10,427,929		10,427,929	83,967,495	25,514,702	109,482,197	99,054,268
22	2028				0	83,967,495	26,049,503	110,016,998	110,016,998
23	2029				0	83,967,495	26,584,304	110,551,799	110,551,799
24	2030				0	83,967,495	27,119,105	111,086,600	111,086,600
25	2031		31,000		31,000	83,967,495	27,653,906	111,621,401	111,590,401
26	2032				0	83,967,495	28,188,707	112,156,202	112,156,202
27	2033				0	83,967,495	28,723,508	112,691,003	112,691,003
28	2034		10,427,929		10,427,929	83,967,495	29,258,309	113,225,804	102,797,875
29	2035				0	83,967,495	29,793,110	113,760,605	113,760,605
30	2036		136,033,145		136,033,145	857,269,039	1,546,723,482	2,403,992,521	2,267,959,376

EIRR = 10.2%

-75,887,171 Colones

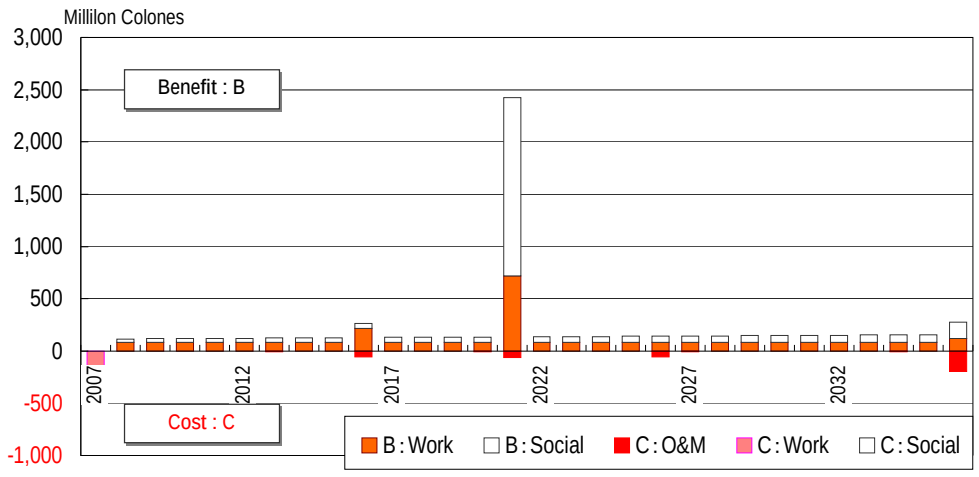


No19 Puente Rio Sarapiqui (R.4)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	459,081,545		3,105,152	462,186,697				-462,186,697
2	2008				0	80,321,580	35,148,093	115,469,673	115,469,673
3	2009				0	80,321,580	36,665,092	116,986,672	116,986,672
4	2010				0	80,321,580	38,182,091	118,503,671	118,503,671
5	2011		31,000		31,000	80,321,580	39,699,090	120,020,669	119,989,669
6	2012				0	80,321,580	41,216,089	121,537,668	121,537,668
7	2013		5,985,085		5,985,085	80,321,580	42,733,088	123,054,667	117,069,582
8	2014				0	80,321,580	44,250,087	124,571,666	124,571,666
9	2015				0	80,321,580	45,767,086	126,088,665	126,088,665
10	2016		53,149,016		53,149,016	215,009,855	47,284,352	262,294,206	209,145,190
11	2017				0	80,321,580	48,801,083	129,122,663	129,122,663
12	2018				0	80,321,580	50,318,082	130,639,662	130,639,662
13	2019				0	80,321,580	51,835,081	132,156,661	132,156,661
14	2020		5,985,085		5,985,085	80,321,580	53,352,080	133,673,660	127,688,574
15	2021		60,818,649		60,818,649	721,527,188	1,700,941,447	2,422,468,635	2,361,649,986
16	2022				0	80,321,580	56,386,078	136,707,657	136,707,657
17	2023				0	80,321,580	57,903,077	138,224,656	138,224,656
18	2024				0	80,321,580	59,420,076	139,741,655	139,741,655
19	2025				0	80,321,580	60,937,075	141,258,654	141,258,654
20	2026		53,149,016		53,149,016	80,321,580	62,454,073	142,775,653	89,626,637
21	2027		5,985,085		5,985,085	80,321,580	63,971,072	144,292,652	138,307,567
22	2028				0	80,321,580	65,488,071	145,809,651	145,809,651
23	2029				0	80,321,580	67,005,070	147,326,650	147,326,650
24	2030				0	80,321,580	68,522,069	148,843,649	148,843,649
25	2031		31,000		31,000	80,321,580	70,039,068	150,360,647	150,329,647
26	2032				0	80,321,580	71,556,067	151,877,646	151,877,646
27	2033				0	80,321,580	73,073,066	153,394,645	153,394,645
28	2034		5,985,085		5,985,085	80,321,580	74,590,065	154,911,644	148,926,559
29	2035				0	80,321,580	76,107,064	156,428,643	156,428,643
30	2036		194,279,930		194,279,930	121,038,832	154,662,225	275,701,056	81,421,127

EIRR = 30.1%

NPV at 12% = 1,022,415,782 Colones

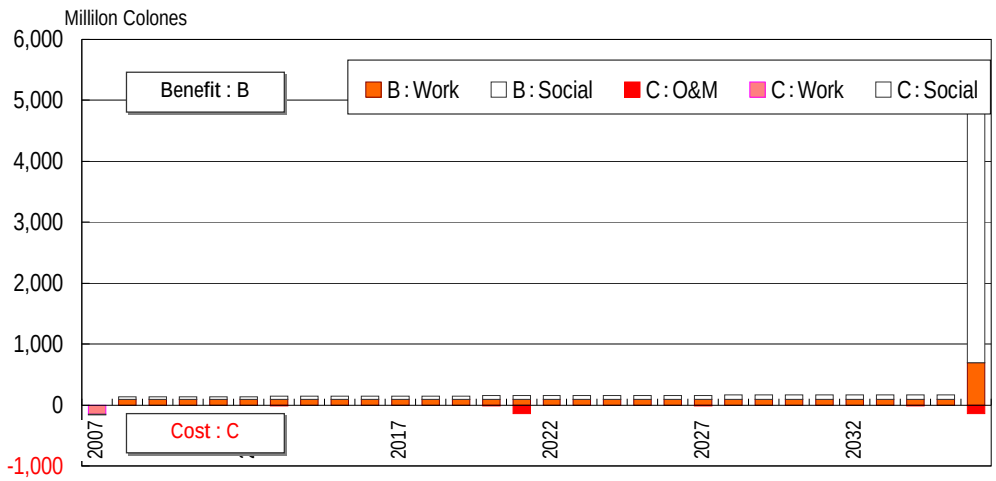


No20 Puente Rio Sucio (R.32)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	149,183,464		15,879,569	165,063,033				-165,063,033
2	2008				0	89,436,367	43,210,248	132,646,615	132,646,615
3	2009				0	89,436,367	44,600,732	134,037,099	134,037,099
4	2010				0	89,436,367	45,991,215	135,427,583	135,427,583
5	2011		31,000		31,000	89,436,367	47,381,699	136,818,066	136,787,066
6	2012				0	89,436,367	48,772,183	138,208,550	138,208,550
7	2013		11,107,108		11,107,108	89,436,367	50,162,666	139,599,033	128,491,925
8	2014				0	89,436,367	51,553,150	140,989,517	140,989,517
9	2015				0	89,436,367	52,943,633	142,380,001	142,380,001
10	2016		168,000		168,000	89,436,367	54,334,117	143,770,484	143,602,484
11	2017				0	89,436,367	55,724,601	145,160,968	145,160,968
12	2018				0	89,436,367	57,115,084	146,551,452	146,551,452
13	2019				0	89,436,367	58,505,568	147,941,935	147,941,935
14	2020		11,107,108		11,107,108	89,436,367	59,896,052	149,332,419	138,225,311
15	2021		137,598,986		137,598,986	89,436,367	61,286,535	150,722,903	13,123,916
16	2022				0	89,436,367	62,677,019	152,113,386	152,113,386
17	2023				0	89,436,367	64,067,503	153,503,870	153,503,870
18	2024				0	89,436,367	65,457,986	154,894,353	154,894,353
19	2025				0	89,436,367	66,848,470	156,284,837	156,284,837
20	2026		168,000		168,000	89,436,367	68,238,953	157,675,321	157,507,321
21	2027		11,107,108		11,107,108	89,436,367	69,629,437	159,065,804	147,958,696
22	2028				0	89,436,367	71,019,921	160,456,288	160,456,288
23	2029				0	89,436,367	72,410,404	161,846,772	161,846,772
24	2030				0	89,436,367	73,800,888	163,237,255	163,237,255
25	2031		31,000		31,000	89,436,367	75,191,372	164,627,739	164,596,739
26	2032				0	89,436,367	76,581,855	166,018,223	166,018,223
27	2033				0	89,436,367	77,972,339	167,408,706	167,408,706
28	2034		11,107,108		11,107,108	89,436,367	79,362,823	168,799,190	157,692,082
29	2035				0	89,436,367	80,753,306	170,189,673	170,189,673
30	2036		137,735,986		137,735,986	697,912,732	4,185,237,311	4,883,150,043	4,745,414,056

EIRR = 81.2%

NPV at 12% = 1,112,274,555 Colones

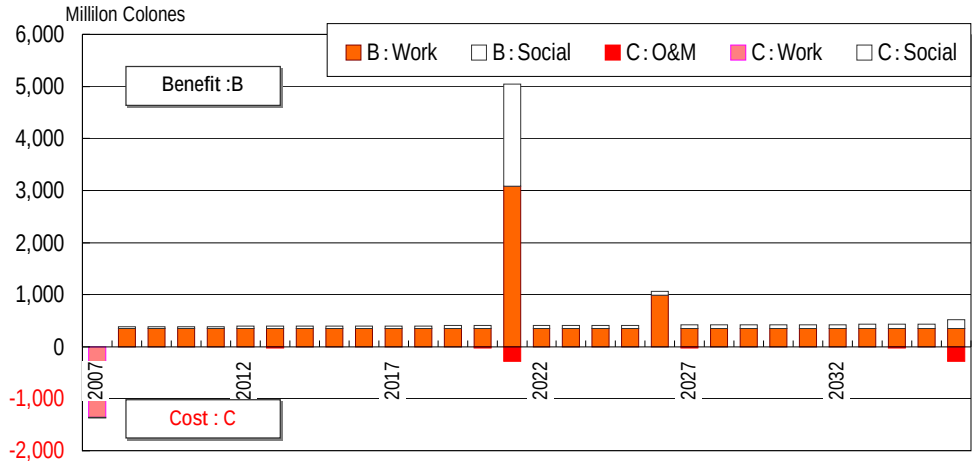


No26 Puente Rio Chirripo (R.32)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	1,355,277,221		11,437,992	1,366,715,214				-1,366,715,214
2	2008				0	343,814,571	41,049,885	384,864,456	384,864,456
3	2009				0	343,814,571	42,732,137	386,546,708	386,546,708
4	2010				0	343,814,571	44,414,388	388,228,959	388,228,959
5	2011		31,000		31,000	343,814,571	46,096,640	389,911,211	389,880,211
6	2012				0	343,814,571	47,778,891	391,593,462	391,593,462
7	2013		25,619,012		25,619,012	343,814,571	49,461,142	393,275,713	367,656,701
8	2014				0	343,814,571	51,143,394	394,957,965	394,957,965
9	2015				0	343,814,571	52,825,645	396,640,216	396,640,216
10	2016		168,000		168,000	343,814,571	54,507,897	398,322,468	398,154,468
11	2017				0	343,814,571	56,190,148	400,004,719	400,004,719
12	2018				0	343,814,571	57,872,399	401,686,970	401,686,970
13	2019				0	343,814,571	59,554,651	403,369,222	403,369,222
14	2020		25,619,012		25,619,012	343,814,571	61,236,902	405,051,473	379,432,461
15	2021		283,132,225		283,132,225	3,088,479,607	1,950,493,762	5,038,973,369	4,755,841,145
16	2022				0	343,814,571	64,601,405	408,415,976	408,415,976
17	2023				0	343,814,571	66,283,656	410,098,227	410,098,227
18	2024				0	343,814,571	67,965,908	411,780,479	411,780,479
19	2025				0	343,814,571	69,648,159	413,462,730	413,462,730
20	2026		168,000		168,000	989,167,656	71,331,369	1,060,499,024	1,060,331,024
21	2027		25,619,012		25,619,012	343,814,571	73,012,662	416,827,233	391,208,221
22	2028				0	343,814,571	74,694,913	418,509,484	418,509,484
23	2029				0	343,814,571	76,377,165	420,191,736	420,191,736
24	2030				0	343,814,571	78,059,416	421,873,987	421,873,987
25	2031		31,000		31,000	343,814,571	79,741,668	423,556,238	423,525,238
26	2032				0	343,814,571	81,423,919	425,238,490	425,238,490
27	2033				0	343,814,571	83,106,170	426,920,741	426,920,741
28	2034		25,619,012		25,619,012	343,814,571	84,788,422	428,602,993	402,983,980
29	2035				0	343,814,571	86,470,673	430,285,244	430,285,244
30	2036		283,269,225		283,269,225	348,540,475	167,148,694	515,689,169	232,419,945

EIRR = 30.8%

NPV at 12% = 2,752,424,784 Colones



No29 Puente Rio Torres (R.218)

	year	Costs				Benefits			Results
		Work		Social	Total Cost	Work	Social	Total Benefit	Net Benefit
		Rehabli. & Renf.	Maintenance	Traffic Rest.	(A)	Scenario 1 to 5	Scenario 1 to 5	(B)	(B-A)
1	2007	230,865,456		3,190,223	234,055,679				-234,055,679
2	2008				0	45,665,493	1,928,868	47,594,361	47,594,361
3	2009				0	45,665,493	1,963,222	47,628,715	47,628,715
4	2010				0	45,665,493	1,997,576	47,663,069	47,663,069
5	2011		31,000		31,000	45,665,493	2,031,930	47,697,424	47,666,424
6	2012				0	45,665,493	2,066,285	47,731,778	47,731,778
7	2013		3,938,649		3,938,649	45,665,493	2,100,639	47,766,132	43,827,483
8	2014				0	45,665,493	2,134,993	47,800,486	47,800,486
9	2015				0	45,665,493	2,169,347	47,834,841	47,834,841
10	2016		35,033,604		35,033,604	45,665,493	75,978,806	121,644,300	86,610,696
11	2017				0	45,665,493	2,238,056	47,903,549	47,903,549
12	2018				0	45,665,493	2,272,410	47,937,904	47,937,904
13	2019				0	45,665,493	2,306,764	47,972,258	47,972,258
14	2020		3,938,649		3,938,649	45,665,493	2,341,119	48,006,612	44,067,963
15	2021		40,033,972		40,033,972	45,665,493	2,375,473	48,040,966	8,006,994
16	2022				0	45,665,493	2,409,827	48,075,321	48,075,321
17	2023				0	45,665,493	2,444,181	48,109,675	48,109,675
18	2024				0	45,665,493	2,478,536	48,144,029	48,144,029
19	2025				0	45,665,493	2,512,890	48,178,383	48,178,383
20	2026		35,033,604		35,033,604	155,172,928	2,547,244	157,720,172	122,686,568
21	2027		3,938,649		3,938,649	45,665,493	2,581,599	48,247,092	44,308,443
22	2028				0	45,665,493	2,615,953	48,281,446	48,281,446
23	2029				0	45,665,493	2,650,307	48,315,800	48,315,800
24	2030				0	45,665,493	2,684,661	48,350,155	48,350,155
25	2031		31,000		31,000	45,665,493	2,719,016	48,384,509	48,353,509
26	2032				0	45,665,493	2,753,370	48,418,863	48,418,863
27	2033				0	45,665,493	2,787,724	48,453,217	48,453,217
28	2034		3,938,649		3,938,649	45,665,493	2,822,078	48,487,572	44,548,923
29	2035				0	45,665,493	2,856,433	48,521,926	48,521,926
30	2036		127,908,655		127,908,655	45,665,493	2,890,787	48,556,280	-79,352,375

EIRR = 20.7%

NPV at 12% = 155,854,489 Colones