# SH12 MATAKOHE IMPROVEMENTS

# PFR ADDENDUM



*Prepared for*

**New Zealand Transport Agency**
**Contract Number PA3163**

NZ TRANSPORT AGENCY
WAKA KOTAHI

December 2008

42124313/R002

# SP3 General road improvements

## Evaluation Summary — Worksheet 1

1 Evaluator(s): Maria Goff

Reviewer(s): DJBellamore 18/12/08

2 **Project/package details**

| | |
|---|---|
| Approved organisation name | NZTA |
| Project/package name | SH 12 Matakohi Stage 1 &2 Combined |
| Your reference | PDM |
| Project description | Gross realignment and replacement of Andersons single lane Bridge and Hardys Bridge |
| Describe the problem to be addressed | Slow difficult section highway with two single lane bridges and accident history |

3 **Location**

Brief description of location: Northland

4 **Alternatives and options**

Describe the do minimum: Maintain current asset

Summarise the options assessed: Option name: New option 3-Stage 1&2

Description: Gross realignment and replacement of Andersons single lane Bridge and Hardys Bridge

5 **Timing**

| | |
|---|---|
| Time zero (assumed construction start date) | 1/07/2008 |
| Expected duration of construction (months) | 12 |

6 **Economic efficiency**

| | | | | | |
|---|---|---|---|---|---|
| Date economic evaluation completed | 17/12/2008 | | | | |
| Base date for costs and benefits | 1/07/2008 | | | | |
| Discount rate (%) | 8.0 | | | | |
| Analysis period (years) | 30 | | | | |
| AADT at time zero | 1,895.0 | User defined traffic mix | | | |
| Traffic growth rate at time zero (%) | 1.40 | | | | |
| Existing roughness | 4.12 IRI | | Existing traffic speed | 62 | km/h |
| Predicted roughness | 2.65 IRI | | Predicted traffic speed | 100 | km/h |
| Length of road before works | 3.350 km | | | | |
| Length of road after works | 2.360 km | | | | |

7 **PV cost of do minimum** $530,793 A

8 **PV cost of the preferred option** $15,627,176 B

9 **Benefit values from worksheet 4, 5 and 6**

| | | | | | | |
|---|---|---|---|---|---|---|
| PV travel time cost savings | $6,327,372 | C × Update factor $^{TTC}$ | 1.19 | = | $7,529,573 | W |
| PV VOC and CO2 savings | $5,707,852 | D × Update factor $^{VOC}$ | 1.00 | = | $5,707,852 | Y |
| PV accident cost savings | $7,075,848 | E × Update factor $^{AC}$ | 1.09 | = | $7,712,674 | Z |

10 BCRN = PV net benefits / PV net costs = (W + Y + Z) / (B - A) = $20,950,099 / $15,096,383 = **1.4**

11 FYRR = PV 1st year benefits / PV net costs = [(W+Y)/DF(voc) + Z/DF(ac)]×0.93 / (B - A) = 10%

# PFR: Project feasibility report

## Preliminary evaluation — PFR

1 Evaluator(s): *Maria Goff*

Reviewer(s):

Approved organisation name: *NZTA*

Project/package name: *SH 12 Matakohi Stage 1 &2 Combined*

Your reference: *PDM*

Project description: *Gross realignment and replacement of Andersons single lane Bridge and Hardys Bridge*

Describe the problem to be addressed: *Slow difficult section highway with two single lane bridges and accident history*

Brief description of location: *Northland*

Describe the do minimum: *Maintain current asset*

Summarise the options assessed: Option name *New option 3-Stage 1&2*; Description *Gross realignment and replacement of Andersons single lane Bridge and Hardys Bridge*

2 Time zero (assumed construction start date): *1/07/2008*

Expected duration of construction (months): *12*

Date economic evaluation completed: *17/12/2008*

Base date for costs and benefits: *1/07/2008*

Discount rate (%): *8.0*

Analysis period (years): *30*

Road type: *Rural Other*

Travel time cost (**TT**) - from table 1: *$24.40* Posted speed limit: *100km/h rem*

**AADT** at time zero: *1,895.0*

| Variable | Do minimum (M) | | Option (P) | | |
|---|---|---|---|---|---|
| PV cost | **A** | *$530,793* | **B** | *$15,627,176* | |
| Length | **LM** | *3.350* | **LP** | *2.360* | km |
| Mean vehicle speed | **MSM** | *62* | **MSP** | *100* | km/h |
| Base cost (CB) | **CBM** | *49.02¢* | **CBP** | *46.36¢* | ¢/km |
| Average roughness (IRI or NAARSA counts) | | *4.12 /108* | | *2.65 /69* | |
| Roughness cost (CR) | **CRM** | *3.73¢* | **CRP** | *0.14¢* | ¢/km |
| Average vehicle speed (VS) | **VSM** | *62* | **VSP** | *100* | km/h |
| Annual maintenance costs (MC) | **MCM** | *$29,700* | **MCP** | *$10,660* | $/yr |

3 Results

| | | | | | | |
|---|---|---|---|---|---|---|
| PV travel time cost savings | *$6,327,372* | **C** × Update factor $^{TTC}$ | *1.19* | = | *$7,529,573* | **W** |
| VOC and CO2 savings | *$5,707,852* | **D** × Update factor $^{VOC}$ | *1.00* | = | *$5,707,852* | **Y** |
| PV Accident cost savings | *$7,075,848* | **E** × Update Factor $^{AC}$ | *1.09* | = | *$7,712,674* | **Z** |

# PFR: Project feasibility report

| **Preliminary evaluation** | | **PFR** |
|---|---|---|
| 4 Benefits | = | $20,950,099 |
| Costs | = | $15,096,383 |
| BCR | = | **1.4** |