

# DEVELOPMENT ASSESSMENT FORUM

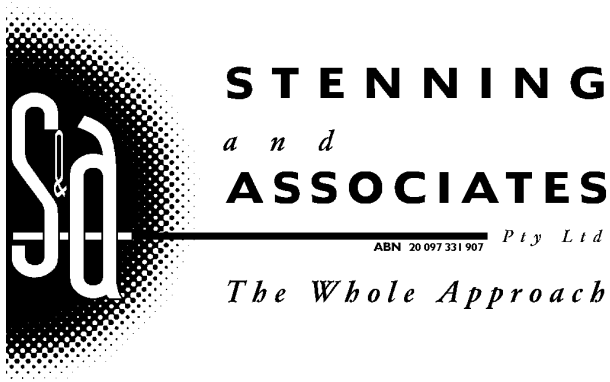
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## *Benefit Cost Analysis for Electronic Development Assessment*

### *Additional Modelling Report*

*June 2004*

**Version 1.0**



Commercial-in-Confidence



# DOCUMENT CONTROL

## Document Location

This document is only valid on the day it was printed.

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## Revision History

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## Final Approvals

This document requires the following approvals for release to client.

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## DISCLAIMER

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## GLOSSARY

<b>DA</b>	Development Application
<b>DAF</b>	Development Assessment Forum
<b>Discount Rate</b>	The rate at which a dollar is held to lose value as the time at which it is to be received becomes more distant
<b>eDA</b>	Electronic Development Assessment
<b>e-Government</b>	Electronic Government
<b>e-lodgment</b>	Electronic lodgment
<b>Large local government</b>	Receives greater than or equal to 2000 DAs per annum.
<b>Medium local government</b>	Receives greater than or equal to 1000 and less than 2000 DAs per annum
<b>Net Present Value</b>	The future stream of benefits and costs converted into equivalent values today. This is done by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits.
<b>Non-uniform scenario</b>	A situation where non-uniform eDA protocols are developed (by vendors) in the market.
<b>NPV</b>	Net Present Value
<b>Original Report</b>	<i>Benefit Cost Analysis for Electronic Development Assessment – Final Report – Version 1.0</i> , presented by Stenning & Associates Pty Ltd to the DAF Working Group meeting on 10 May 2004.
<b>Small local government</b>	Receives less than 1000 DAs per annum
<b>Uniform scenario</b>	A situation where a uniform eDA protocol is introduced.



## **I    PURPOSE**

The purpose of this report is to provide the Development Assessment Forum (DAF) with the results of additional modelling of the benefits and costs arising from the proposed introduction of a National Standard Communication Protocol for the electronic exchange of development assessment information (proposed eDA protocol).

This report should be read in conjunction with the *Benefit Cost Analysis for Electronic Development Assessment – Final Report - Version 1.0* (the original report), prepared for DAF by Stenning & Associates Pty Ltd.

## 2 ADDITIONAL MODELLING SCENARIO

Following a DAF Working Group meeting on 10 May 2004 to consider, amongst other things, the original report, Stenning & Associates was requested to identify the benefits of the adoption of a uniform eDA protocol as compared with the development of multiple eDA systems using multiple protocols. That is, a comparison is to be done of the net benefits and costs of the following scenarios:

- **Uniform scenario** - A situation where a uniform eDA protocol is introduced; and
- **Non-uniform scenario** - A situation where non-uniform eDA protocols are developed (by vendors) in the market.

This differs marginally from the scenario in the original report in that it seeks more active modelling of the potential development of non-uniform eDA protocols as the baseline.

### 2.1 Assumptions

The additional modelling makes the same assumptions as contained in the original report, subject to the following variations. It also uses the same formula codes as in the original report.

#### 2.1.1 Set-up Costs

The modelling assumes that the eDA protocol scenario results in reduced set-up costs for local government. This was achieved by:

- **Leaving the set up costs for the eDA Protocol scenario the same (\$50 000 per council), but reflecting higher set-up costs for the non-uniform scenario.** The higher set-up costs were set at \$300 000 for the short term, but declining by 10 percent per annum over 10 years to reflect the likelihood of a reducing number of eDA protocols over time and the potential for the development of connectivity between protocols. In addition, the set-up costs for the uniform scenario were also set so they declined over time at the rate of 5 percent per annum. For both scenarios it was assumed that the annual licensing fees were fixed at 3 percent of the initial capital cost.
- **Reducing the Local Government take-up rate for eDA initiatives for the non-uniform scenario to reflect the higher costs involved.** It was considered that the higher set-up costs for the non-uniform scenario would result in a relatively slow roll-out of eDA initiatives, but with a much more rapid deployment where a uniform eDA protocol exists. This was reflected in the model by assuming a 100 percent, 75 percent and 50 percent reduction in the take-up rate for eDA initiatives in the non-uniform scenario for small, medium and large local governments respectively. This assumption reflects the likelihood that eDA initiatives will be prohibitively expensive for small local government in the non-uniform scenario. It also reflects an expectation that the take-up of eDA will be slower for medium and large local governments due to cost considerations. Table 1 details the council take-up rates for the uniform and non-uniform scenarios.

**Table 1: Local Government take-up rate profile for eDA initiatives**

Local Government Strata	eDA initiative take-up rate					
	Short Term		Medium Term		Long Term	
	Uniform	Non-Uniform	Uniform	Non-Uniform	Uniform	Non-Uniform
Large	50 %	25%	80 %	40%	100 %	50%
Medium	40 %	10%	65 %	16.3%	80 %	20%
Small	15 %	0%	20 %	0%	25 %	0%

### 2.1.2 Customer take-up rates

The modelling incorporates the concept of penalties being imposed for non-eDA lodgement as an incentive to lodge via eDA. That is, if a council has eDA capabilities that enable electronic lodgement of DAs, then a penalty is imposed upon development applications (DAs) that are lodged manually.

To do this, a shift in the take-up rate for customers was assumed to reflect the impact of the penalties. To simplify matters, it was assumed that the penalties increased the rate of usage of eDA lodgement initiatives by 50 percent across both professional and occasional users. It was also assumed that all jurisdictions use this incentive approach in both the uniform and non-uniform eDA protocol scenarios.

Table 2 details the customer take-up rate assumptions that were used.

**Table 2: Customer take-up rate profile**

Customer segment	Proportion of Total Applications	Short term (<12 months)		Medium Term (1-5 years)		Long Term (> 5 years)	
		Uniform	Non-Uniform	Uniform	Non-Uniform	Uniform	Non-Uniform
Industry Professionals	80%	20%	30%	60%	90%	80%	100%
Occasional Developers	20%	2.5%	3.8	10%	15%	15%	22.5%

The definitions used in this assumption are:

- Proportion of Total Applications      Proportion of total development applications lodged by customer segment (regardless of lodgement method).
- Industry Professionals      Persons who regularly prepare and lodge development applications on their own behalf or on behalf of clients (for a fee).
- Occasional Developers      Individuals and small businesses who are first time or infrequent developers

## 3 RESULTS - ESTIMATED BENEFITS AND COSTS

This section outlines the results of the additional modelling. In all cases, the estimated results cover a 10-year period.

As was the case in the original report, the major benefits flowing from the implementation of the proposed uniform eDA protocol are:

- Avoided costs for industry and Decision Authorities, such as reduced costs associated with interactions between clients and Decision authorities, lodgement, data entry, publishing costs, administration, filing and archiving and so on. Significantly, it includes changes in capital set-up costs experienced in moving from the non-uniform to the uniform scenario, with the reduced set-up costs in the uniform scenario delivering a benefit to the additional local governments that take up eDA initiatives in this scenario.
- Opportunity costs for industry associated with reductions in the time taken to receive a decision on a DA transaction.

These results are subject to the same qualifications regarding the **limited** nature of the modelling and data constraints as applied to the original report. Accordingly, the results of this additional modelling should be treated with some caution and considered only indicative of the likely impact of the development and implementation of the proposed uniform eDA protocol.

### 3.1 Usage of eDA

Table 1 illustrates the expected growth in the number and proportions of DAs lodged with local government as a result of moving from the non-uniform scenario to the uniform scenario. This shows that ten years following the introduction of the proposed uniform eDA protocol, some 53.5 percent additional of DAs could be lodged electronically, with around half of those being handled by large local governments.

**Table 3: Estimated change in the number and proportion of development applications lodged electronically under uniform eDA protocol scenario (Formula Code: veDAN and PrDAN)**

Year	Change in the number of DAs submitted via eDA				Change in the percentage of total DAs submitted via eDA			
	Council Size				Council Size			
	Small	Medium	Large	Total change in DAs sub'tted via eDA	Small	Medium	Large	Total change in DAs sub'tted via eDA
1	5717	11434	9528	26680	1.7%	3.5%	2.9%	8.1%
2	9337	19931	16520	45788	2.8%	6.1%	5.0%	14.0%
3	13441	30242	24962	68645	4.1%	9.2%	7.6%	20.9%
4	18028	42366	34855	95249	5.5%	12.9%	10.6%	29.0%
5	23099	56305	46199	125602	7.0%	17.2%	14.1%	38.3%
6	24869	60395	49737	135002	7.6%	18.4%	15.2%	41.1%
7	26697	64618	53393	144708	8.1%	19.7%	16.3%	44.1%
8	28583	68972	57166	154721	8.7%	21.0%	17.4%	47.1%
9	30528	73458	61056	165042	9.3%	22.4%	18.6%	50.3%
10	32532	78076	65063	175670	9.9%	23.8%	19.8%	53.5%

### 3.2 Overall Benefits and Costs

The additional modelling shows potentially significant net benefits accruing at a national level to both local government and industry from moving from the non-uniform to uniform scenarios. The key findings are illustrated in Table 4 and Table 5.

- For local government nationally, the net discounted benefits are estimated at almost \$80 million over ten years. These benefits are spread fairly evenly over the short, medium and long terms.
- Small local governments stand to gain the most, realising net savings of around \$41 million over ten years. This reflects the uniform scenario making eDA initiatives affordable for this stratum, which consists of over 90 percent of all local governments. This can be compared with the non-uniform strata where the cost of eDA initiatives was assumed to be prohibitive.
- Medium and large local governments stand to gain \$21.9 million and \$16.8 million respectively. These figures are significantly less than the potential gains for small local governments, despite individual local governments in these strata gaining significantly more benefits (\$1.2 million and \$2.4 million respectively). This is due to the smaller numbers of local governments in these strata.
- For industry the net discounted benefits are even more substantial, estimated at \$122.5 million over ten years. This comprises almost \$54 million in avoided costs and \$68.6 million in opportunity cost benefits derived from the time savings accruing to industry (ie, the opportunity cost of investment “brought forward”).

**Table 4: Summary of estimated net benefits to local government and industry - by time period - uniform scenario compared to non-uniform scenario**

	Estimated discounted net benefits \$ million			
	Short term	Medium term	Long term	Total
<b>Net benefits to local government</b> (Formula Code: NatBNPV)	\$27.1	\$23.0	\$29.6	\$79.7
<b>Net benefits to industry – avoided costs</b> (Formula Code: InACNPV)	\$2.0	\$19.9	\$32.0	\$53.8
<b>Net benefits to industry – opportunity cost derived from time savings</b> (Formula Code: InOCNPV)	\$2.1	\$23.5	\$43.1	\$68.6
<b>Total estimated net benefits to industry</b>	\$4.1	\$43.3	\$75.1	\$122.5

**Table 5: Estimated net benefits to local government - by strata**

	Estimated discounted net benefits per local government over 10 years Local government strata \$			
	Small	Medium	Large	Total
<b>Net benefits to local government nationally</b> (Formula Code: NatBNPV)	\$41.0 million	\$21.9 million	\$16.8 million	\$79.7 million
<b>Net benefits to individual local governments</b> (Formula Code: NetBNPV)	\$386,577	\$1,165,103	\$2,389,561	

The following sections present these results in more detail.

### 3.3 Local Government Benefits

Table 6 indicates the estimated net benefits per local government in each local government strata over the short, medium and long term arising from the implementation of the proposed eDA protocol and the subsequent move to eDA initiatives. It shows that:

- All local government strata benefit from the move from the non-uniform to uniform scenario.
- The potential net benefits are significant for each local government stratum, but particularly for medium and large local governments.

**Table 6: Estimated net discounted benefits per local government** (Formula Code: NetBNPV)

	Estimated discounted net benefits per local government		
	Local government strata		
	Small	Medium	Large
Short term	\$242,610	\$288,078	\$359,591
Medium term	\$67,997	\$394,186	\$907,214
Long term	\$75,970	\$482,838	\$1,122,756
<b>Total estimated benefits over 10 years</b>	\$386,577	\$1,165,103	\$2,389,561

Table 7 shows that the total discounted net benefits for local government nationally are in the order of \$80 million over a ten-year period. The most significant net benefits in the short term accrue to small local government, with the distribution of the benefits between the local government stratum evening out in the medium and long terms.

Overall, large local governments experience the smallest discounted net benefit (\$16.8 million), attributable to assumptions that half of them will still implement eDA initiatives in the non-uniform scenario. On the other hand, small local governments experience the largest net benefit (\$41 million) due to the assumption that no small local government will implement eDA in the non-uniform scenario.

**Table 7: Estimated benefits to local government nationally** (Formula Code: NatBNPV)

	Estimated discounted net benefits per local government nationally			
	Local government strata			
	Small	Medium	Large	Total
Short term	\$21,944,037	\$3,543,360	\$1,618,157	\$27,105,555
Medium term	\$9,451,317	\$7,608,409	\$5,974,892	\$23,034,618
Long term	\$9,628,492	\$10,772,035	\$9,195,124	\$29,595,652
<b>Total estimated benefits over 10 years</b>	\$41,023,846	\$21,923,804	\$16,788,173	\$79,735,824

The net discounted benefits for local government will vary according to the values of a range of key variables. Accordingly, the sensitivity of the national results was calculated for the variables shown in Table 8.

Table 8: Variables subject to sensitivity analysis

Variable	Scenarios	Description
eDA take-up rates	Low	Medium reduced by 10 percent
	Medium	
	High	Medium increased by 10 percent
Savings per development application	Low	\$70 per development application
	Medium	\$110 per development application
	High	\$150 per development application
Start up costs for non-uniform scenario	Low	\$200 000
	Medium	\$300 000
	High	\$400 000
Discount rate	Low	7 percent
	Medium	9 percent
	High	11 percent

The tables below illustrate varying degrees of sensitivity to positive or negative changes to key variables.

Table 9 suggests a slightly less than proportionate sensitivity to changes in eDA take-up rates by local government. That is, a 10 percent increase or decrease in take-up has a similar level of impact on the discounted net benefits in terms of percentage change. For example, if take-up is increased by 10 percent, the national discounted net benefit increases from around \$80 million to over \$87 million, an increase of approximately 9 percent.

Table 9: Sensitivity of estimated benefits to local government nationally to changes in eDA take-up rates

	Estimated discounted net benefits to local government nationally			
	Local government strata (\$ million)			
	Small	Medium	Large	Total
Low (less 10 percent)	\$36.9	\$19.7	\$15.1	\$71.8
Medium	\$41.0	\$21.9	\$16.8	\$79.7
High (plus 10 percent)	\$45.1	\$24.1	\$17.9	\$87.1

As shown in Table 10, the results have a low to medium sensitivity to changes in the savings per DA application. In the scenario where the savings are increased by 36 percent to \$150 per DA application, large local governments nationally realise a net benefits increase of 33 percent to over \$22 million, whilst medium local governments experience an increase of around 30 percent to \$28.4 million. The impact on small local governments is much less, with an increase of only 12 percent to \$46 million.

If the savings are reduced by 36 percent to \$70 per DA application, the impact experienced is similar in the reverse direction.

**Table 10: Sensitivity of estimated benefits to local government nationally to changes in savings per development application**

	Estimated discounted net benefits to local government nationally			
	Local government strata (\$ million)			
	Small	Medium	Large	Total
Low (\$70 per development application)	\$36.1	\$15.5	\$11.3	\$62.9
Medium (\$110 per development application)	\$41.0	\$21.9	\$16.8	\$79.7
High (\$150 per development application)	\$46.0	\$28.4	\$22.3	\$96.7

Table 11 shows a medium sensitivity of the results for changes in start-up costs for the non-uniform scenario. Nationally the total discounted net benefits increases by around 17 percent to over \$93 million if start-up costs are increased by 50 percent, with a similar percentage change in the other direction to just over \$66 million for a 50 percent reduction in start-up costs.

- For small local government, a 50 percent increase or reduction in the start-up cost results in a 27 percent increase or decrease in the benefits.
- The change for large and medium local government is much less, experiencing a 4 percent and 8 percent increase/decrease respectively.

**Table 11: Sensitivity of estimated benefits to local government nationally to changes in start-up costs for eDA initiatives**

	Estimated discounted net benefits to local government nationally			
	Local government strata (\$ million)			
	Small	Medium	Large	Total
Low (\$200 000)	\$29.9	\$20.2	\$16.2	\$66.3
Medium (\$300 000)	\$41.0	\$21.9	\$16.8	\$79.7
High (\$400 000)	\$52.2	\$23.7	\$17.4	\$93.3

In terms of sensitivity to changes in discount rates, the findings in Table 12 suggest a low to medium sensitivity to this variable. Impacts are most significant for the medium and large local government strata. If the discount rate is reduced to 7 percent, the national discounted net benefits increase by 8.6 percent to around \$87 million. A 2 percentage point increase in the discount rate will decrease the national discounted net benefits by 7.4 percent to just under \$74 million.

**Table 12: Sensitivity of estimated benefits to local government nationally to changes in discount rate**

	Estimated discounted net benefits to local government nationally			
	Local government strata (\$ million)			
	Small	Medium	Large	Total
Low (7 percent)	\$43.6	\$24.3	\$18.7	\$86.6
Medium (9 percent)	\$41.0	\$21.9	\$16.8	\$79.8
High (11 percent)	\$38.8	\$19.9	\$15.1	\$73.9

### 3.4 Industry Benefits

#### 3.4.1 Industry avoided costs

As shown in Table 13, it is estimated that industry avoids substantial lodgement costs over the long term as a result of moving to the uniform scenario, with industry benefiting by between \$48 and \$60 million, depending on the discount rate used. Consistent with the assumed take-up rate profiles, these benefits increase significantly in the medium to long term as increasing numbers of DA applications are submitted via eDA facilities.

**Table 13: Industry net benefits arising from avoided lodgement costs** (Formula Code: InAC<sub>NPV</sub>)

	Total Industry Benefits (Cumulative discounted net present value)		
	\$ (millions)		
	7% discount rate	9% discount rate	11% discount rate
Short Term	\$2.1	\$2.0	\$2.0
Medium Term	\$21.3	\$19.9	\$18.5
Long Term	\$37.1	\$32.0	\$27.7
<b>Total</b>	<b>\$60.4</b>	<b>\$53.8</b>	<b>\$48.2</b>

A sensitivity analysis was undertaken where the assumed avoided costs per residential and commercial development application (\$75 and \$150) were varied by plus and minus 10 percent. Table 14 illustrates that the sensitivity of these avoided costs is directly proportional to changes in the assumed savings per development application. That a 10 percent decrease in avoided costs reduces the net benefits to industry by 10 percent (\$5 million over 10 years) and vice versa for an increase.

Table 14: Sensitivity of industry net benefits to changes in assumed avoided lodgement costs

	Total Industry Benefits (Cumulative Discounted net Benefits)		
	\$ millions		
	Low (less 10 percent)	Medium	High (plus 10 percent)
Short Term	\$1.8	\$2.0	\$2.2
Medium Term	\$17.9	\$19.9	\$21.8
Long Term	\$28.8	\$32.0	\$35.2
Total	\$48.5	\$53.8	\$59.2

### 3.4.2 Opportunity cost of investment “brought forward”

Table 15 shows the estimated savings in approval time gained per local government strata<sup>1</sup> over the short, medium and long term, based on the assumed time saving per development application of 5 days. Table 16 shows the estimated time-savings nationally.

Table 15: Estimated savings in approval times per local government (Formula Code: SATI)

	Estimated Time Savings (days)			
	Council Strata			
	Small	Medium	Large	Total
Short term	29,729	1,070	3,182	33,980
Medium term	797	21,071	61,708	83,575
Long term	1,403	36,522	108,631	146,556
Total estimated time savings over 10 years	31,928	58,663	173,521	264,112

Table 16: Estimated savings in approval times nationally (Formula Code: SATI)

	Estimated Time Savings (days)			
	Council Strata			
	Small	Medium	Large	Total
Short term	29,729	43,859	57,272	130,861
Medium term	480,466	863,897	1,110,739	2,455,102
Long term	845,820	1,497,421	1,955,364	4,298,605
Total estimated time-savings nationally over 10 years	1,356,014	2,405,177	3,123,375	6,884,567
Estimated percentage improvement in approval times	3%	16%	20%	9%

<sup>1</sup> This refers to the elapsed time taken to process a DA. It does not reflect the savings to local government in terms of person days.

These tables show that the greatest benefits accrue to large and medium sized local governments. This stems from the large number of development applications received by these strata, together with their substantially higher estimated take-up rate of eDA in the uniform scenario.

As a consequence, the time-savings accruing to industry in the medium to long term are also more significant. Based on these estimated time-savings, Table 17 shows the estimated value to industry arising from the introduction of the proposed eDA protocol and the subsequent move to eDA initiatives.

**Table 17: Industry benefits arising from estimated savings in approval time** (Formula Code: InOC<sub>NPV</sub>)

	Industry Benefits (Cumulative discounted net present value)		
	\$ million		
	7% discount rate	9% discount rate	11% discount rate
Short Term	\$1.6	\$2.1	\$2.5
Medium Term	\$19.3	\$23.5	\$27.1
Long Term	\$38.1	\$43.1	\$46.5
<b>Total</b>	<b>\$59.1</b>	<b>\$68.6</b>	<b>\$76.1</b>

These results show that the potential benefits to industry from the estimated savings in approval time are substantial over time. These benefits arise from industry’s ability to achieve investments earlier than would be the case without the proposed eDA protocol being in place, hence allowing industry to earn a revenue stream on this investment “brought forward”.

The cumulative industry net benefits range from \$59.1 million to \$76.1 million over a 10-year time period. The range results from changes to the discount rate, which also changes the opportunity cost of capital faced by industry (the model assumes that the opportunity cost of capital for industry equals the discount rate).

The majority of benefits accrue during the medium to long term, which is largely due to the take-up rates of eDA by local governments (and hence by customers) being higher in later years under the uniform scenario.

A critical assumption in the estimation of these industry benefits is clearly the extent of the time-savings experienced by industry as a result of local government implementing eDA initiatives. Table 18 shows the sensitivity of potential industry benefits arising from changes to assumed time-savings of 1 day either side of the original assumption (i.e., times-savings of 4 days and 6 days per application). These figures are calculated using a discount rate of 9%.

Table 18: Sensitivity of industry net benefits to changes in assumed approval time-savings

	Industry Benefits (Cumulative Discounted net Benefits)		
	\$ million		
	Time saving 4 days	Time saving 5 days	Time saving 6 days
Short Term	\$1.7	\$2.1	\$2.5
Medium Term	\$18.8	\$23.5	\$28.2
Long Term	\$34.5	\$43.1	\$51.7
<b>Total</b>	<b>\$54.9</b>	<b>\$68.6</b>	<b>\$82.4</b>

Not surprisingly, these results show that a one day change to lapsed time savings (plus or minus 20 percent) from the introduction of eDA initiatives results in a proportional change in the savings experienced by industry – ie, a 20 percent increase or decrease (\$14 million). This indicates that changes to the assumed time-saving result in significant differences to the total benefits to industry. Nevertheless, even at a saving of 4 days per application the estimated net benefits to the development industry are significant.