

Sydney Beaches Sand Nourishment Program

Preliminary Business Case

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Overview

- Overview of Sydney Beaches Sand Nourishment Program
- Study context
- Approach to 'value for money' assessment
- Case study 1: Manly
- Case Study 2: Collaroy
- Case study 3: Bate Bay
- Key conclusions

Page 2

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Overview of Sydney Beaches Sand Nourishment Program

- AECOM undertook a scoping study for SCCG to develop a beach sand nourishment program for all Sydney beaches in response to projected sea level rise associated with climate change.
- The main objective of the program is to maintain beach amenity; the program also ameliorates increased hazard risk to infrastructure and housing from sea level rise.
- The scoping study identified potential social, environmental and economic benefits.

Page 3

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Project Impetus

- Historical storm damage
- Historical loss of beach amenity (width)
- Risk to infrastructure in the coastal buffer zone
- Coastline Management Plans
 - Sand nourishment
 - To provide storm buffer
 - To restore/enhance degraded recreational beach amenities.



Project Impetus (continued)

- Climate change sea-level rise
- NSW SLR Policy Statement (2009) - 0.9m (2100)
- SCCG Secured a \$100,000 NDMP grant in 2008
- Scoping Study for the extraction of sand reserves from the 'Sydney Shelf Sand Body' for protection of threatened assets and amenity enhancement.



Collaroy-Narrabeen



Page 6

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Collaroy-Narrabeen



Page 7

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Beach Nourishment Panama City Beach, Florida



Page 8

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The Strand, Townsville



Page 9

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Location of Study (Case Study Sites)

Assets values at close to \$1BN are estimated at threat in these 3 locations alone over a 100 year planning horizon.



Page 10



Study context

On the basis of the potential benefits identified, AECOM prepared a Preliminary Business Case (suitable to be presented as part of the NSW Treasury Gateway System spoken about earlier this morning):

- stating the need for the intervention;
- demonstrating the 'value for money' of the intervention strategy relative to alternative strategies; and
- outlining the governance arrangements necessary to take the intervention proposal through to the next stage of the Gateway System (Final Business Case).

Page 11

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Approach to 'value for money' assessment

'Value for money' was demonstrated by conducting a high-level cost-benefit analysis of investment in a beach sand nourishment program at three case study beaches:

- Collaroy-Narrabeen Beach
- Manly Ocean Beach
- Bate Bay (Cronulla beaches)

Page 12

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What are we measuring in the cost-benefit analysis?

Loss of beach will have economic costs including:

- Expenditure by beach visitors
- Amenity from beach visits (consumer surplus)
- Loss of property within hazard zones
- Amenity from living near a beach
- Rates revenue from residential properties within walking distance of beach as a result of lower property values

Net economic benefit is economic benefit net of the capital and recurrent costs of providing the investment program.

Page 13

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How are we measuring?

- Some of benefits easy to measure – have a market value.
- Typically use an approach called 'Willingness to Pay' or 'Revealed Preference'
 - Ask people how much they are willing to pay to use a beach or live by the beach
 - Look at how far people are willing to travel to the beach or how much they paid for their house near the beach
- However, these approaches are costly and take time
- Alternative approach, used in this study, is to approximate by transferring the results from other studies.
- This study was undertaken before the UNSW Sydney Beaches Valuation Project described by Dave Anning. Results from the UNSW study suggest our approximations may underestimate the non market component of economic benefits.

Page 14

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Each of the components in the benefits equation has involved a range of assumptions

For example, for the Manly Ocean Beach case study, the following data/information needs to be verified during project development from the results of the Sydney Beaches Valuation Project or from additional specific-purpose surveys:

- percentage of day visitors and overnight visitors attracted to Manly by the ocean beach;
- no. of beach visits and average expenditure per beach visit by visitors and residents;
- consumer surplus ('willingness to pay') associated with a beach visit;
- number of retail outlets primarily serving Manly residents;
- property value attributable to beach amenity; and
- rates revenue from residential properties located within easy walking distance of the beach.

Page 15

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Cost-benefit analysis: Manly Ocean Beach

Reasons for selection:

- Iconic status, social and cultural heritage
- Limited ability to respond to climate change sea level rise (seawall + associated lack of back beach barrier dunes)
- Significant reliance of local businesses on beach visitors

Page 16

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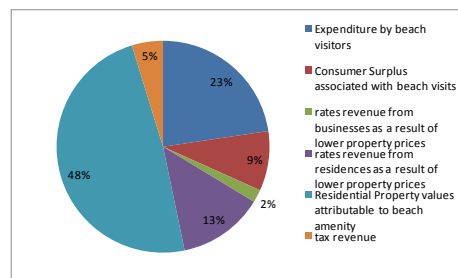
Cost-benefit analysis: Manly Ocean Beach

	Incremental to 'without beach nourishment' (2009 prices)
Cost (undiscounted)	\$92M
Discounted to 2009/10 at 7% real discount rate	
PV Cost	\$35M
PV Benefit	\$83M
NPV	\$48M
BCR	2.4
EIRR	20%

Page 17

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Cost-benefit analysis: Manly Ocean Beach



Page 18

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Cost-benefit analysis: Manly Ocean Beach

Sensitivity analysis demonstrates that the economic viability of the sand nourishment program is robust:

	BCR
Main analysis	2.4
Real discount rate of 4% (7% in main analysis)	3.3
Uplift factor of 1.1 applied to GVA (1.4 in main analysis)	2.2
Exponential relationship between beach width and beach amenity (compared to linear relationship)	3.8
30% increase in project costs	1.8
30% decrease in project benefits	1.7

Page 19

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Cost-benefit analysis: Collaroy-Narrabeen Beach

Reasons for selection:

- Intensively developed residential precinct
- Popularity with the surfing community
- Restricted beach amenity following storms

Page 20

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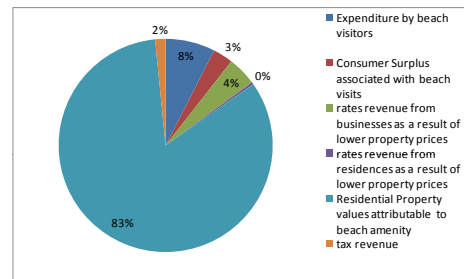
Cost-benefit analysis: Collaroy-Narrabeen Beach

	Incremental to 'without beach nourishment' (2009 prices)
Cost (undiscounted)	\$187M
Discounted to 2009/10 at 7% real discount rate	
PV Cost	\$71M
PV Benefit	\$113M
NPV	\$42M
BCR	1.6
EIRR	12%

Page 21

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Cost-benefit analysis: Collaroy-Narrabeen Beach



Page 22

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Cost-benefit analysis: Collaroy-Narrabeen Beach

Sensitivity analysis demonstrates that the economic viability of the sand nourishment program is robust:

	BCR
Main analysis	1.6
Real discount rate of 4% (7% in main analysis)	2.2
Uplift factor of 1.1 applied to GVA (1.4 in main analysis)	1.5
Exponential relationship between beach width and beach amenity (linear relationship in main analysis)	2.5
30% increase in project costs	1.2
30% decrease in project benefits	1.1

Page 23

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Cost-benefit analysis: Bate Bay (Cronulla beaches)

Reasons for selection:

- Longest beach in Sydney
- Only suburban beach with direct access to the rail system
- History of storm damage
- Extensive dune system
- Significant reliance of local businesses on beach visitors

Page 24

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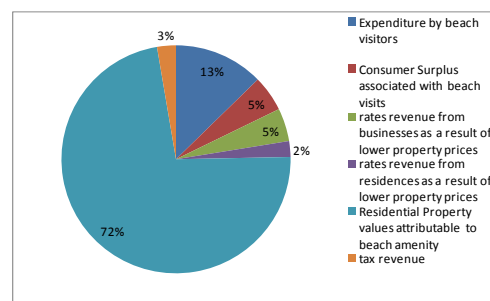
Cost-benefit analysis: Bate Bay (Cronulla beaches)

	Incremental to 'without beach nourishment' (2009 prices)
Cost (undiscounted)	\$225M
Discounted to 2009/10 at 7% real discount rate	
PV Cost	\$86M
PV Benefit	\$99M
NPV	\$13M
BCR	1.2
EIRR	8%

Page 25

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Cost-benefit analysis: Bate Bay (Cronulla beaches)



Page 26

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Cost-benefit analysis: Bate Bay (Cronulla beaches) – 3/3

Sensitivity analysis demonstrates that the economic viability of the sand nourishment program is not robust:

	BCR
Main analysis	1.2
Real discount rate of 4% (7% in main analysis)	1.6
Uplift factor of 1.1 applied to GVA (1.4 in main analysis)	1.1
Exponential relationship between beach width and beach amenity (linear relationship in main analysis)	1.8
30% increase in project costs	0.9
30% decrease in project benefits	0.8

Page 27

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Concluding comments – 1/2

Although the cost-benefit analyses are based on a range of assumptions, they demonstrate that the proposed sand nourishment program is economically viable for each case study beach, although the 'value for money' of each program varies:

- For Manly Ocean Beach, the BCR of 2.4 indicates that, on the basis of the quantified benefits, the program is expected to provide high value for money.
- For Collaroy-Narrabeen Beach, the BCR of 1.6 indicates that, on the basis of the quantified benefits, the program is expected to provide medium value for money.

Page 28

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Concluding comments – 2/2

- For Bate Bay (Cronulla beaches), the BCR of 1.2 indicates that, on the basis of the quantified benefits, the program is expected to provide low value for money.
- The reasons for variation in 'value for money' among the three case study beaches are:
 - Investments costs for Collaroy-Narrabeen Beach and Bate Bay are more than double those of Manly Ocean Beach;
 - Benefits differ because of the individual nature and characteristics of beaches and adjoining land use.
 - Residential property values depend on a wide range of factors.

Page 29

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Thank You

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