CLES

Making places better

# Demystifying Cost Benefit Analysis


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NewStart

The magazine for creating better places

# What is CBA? (1)

**CBA - Which is best?**

"Systematic & unbiased analysis of alternatives to ID the most advantageous ("best") choice."

**What is CBA?**

- CBA does not answer the question: Should we take action
- Business Case looks at: "Whether" we should take action at all
- CBA looks at "Which" solution is better
- ROI looks at "What returns" (Social, Economic, Environmental)

# What is CBA? (2)

**CBA - Which is best?**

"Systematic & unbiased analysis of alternatives to ID the most advantageous ("best") choice."

**Why CBA?**

- Continuous improvement cycle
- Pressure on public purse
- Useful when choosing from several projects
- Useful when costs & benefits need comparing over 1yr+

# What is CBA? (3)

**What questions does it address?**

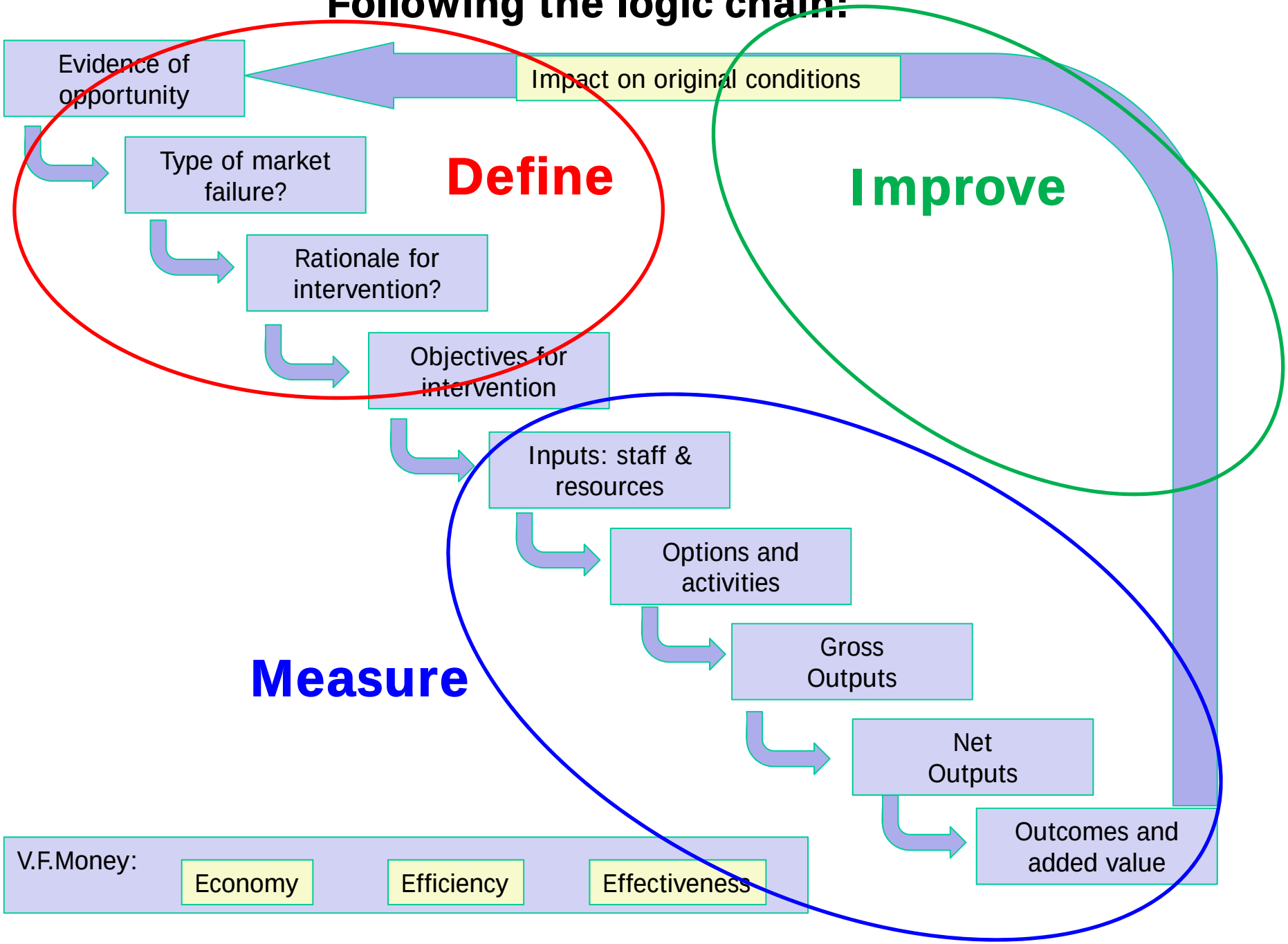
- What economic problem the project is intended to address?
- Are external economic conditions favourable to the project?
- Do benefits justify use of scarce resources to society (profitability)?
- Which alternative gives highest benefits to society per unit cost?
- How is profitability affected if views on income are included?
- What is the relative performance of project alternatives?

# Where to start? (1)

**Two basics questions for all CBA:**

- What would happen if the project were **not** implemented? ("without-case")
- If the project is implemented could this be done in **different** ways? ("with-case…n")
- Consider the **effects** that are attributed exclusively to the project…
- …therefore important to consider the 'logic chain'…

# Following the logic chain:



# Where to start? (2)
# Gross to net calculations

1. **Deadweight:** what would have happened in any case?

2. **Leakage:** the proportion of outputs/outcomes benefiting people from outside the target geography/group

3. **Displacement:** degree to which the project reduces activity elsewhere

4. **Multiplier effects:** positive knock-on effects on the wider economy, through income effects/supply chain linkages

- Choosing the right framework and research to inform your analysis

# Valuing costs and benefits (1)

## Valuing costs & benefits

- **All relevant costs & benefits** of all options should be valued
- Confidence in the background data is critical (more later)
- C&B should be extended to the **lifetime** of the project & impact
- C&B should be based on **market prices** (e.g. accounts)
- Recognise social & environmental issues with no market price (e.g. Improvements to confidence, motivation & well-being)

# Valuing costs and benefits (2)

## Estimating costs

- Costs identified in terms of relevant **opportunity costs**
- fundamental to assessing the **true cost** of any course of action
  - ‘the cost of any activity in terms of the best alternative forgone’
  - e.g. city's decision to build the hospital on vacant land is:
    - the loss of the land for a sport centre; or the money which could have been made from selling the land

# Valuing costs and benefits (3)

## Estimating costs

- Range of costs, including: fixed, variable, 'semi-variable costs:
  - **Fixed:** Typically constant over time, e.g. building rental
  - **Variable:** According to volume of activity, e.g. training costs
  - **Semi-variable:** e.g. core & extended ICT call-out
- For substantial proposals, need to consider the full economic costs: direct & indirect costs
- Eliminate interest, profit & depreciation…

# Valuing costs and benefits (4)

**Valuation techniques:**

- Determine whether impacts can be measured & quantified, and
- Whether prices can be determined from market data

If not…

- **Benefits:**
  Use **willingness to pay (WTP)**
  for a benefit
- **Costs:**
  Can you identify **compensation (WTA)**
  to accept costs?

# Valuing costs and benefits (5)

## Estimating benefits – Key issues

- All benefits relating to outputs & outcomes should be considered
- What outputs and outcomes are related to the project?
- Assumptions for period over which outputs & outcomes appraised?
- Which of these outputs & outcomes are direct, which are indirect?
- What, if any, are the less easily quantified outputs & outcomes?
- What are the net additional impacts? Who benefits?
- *All impacts* (positive & negative) should be clearly considered

# Worked examples (1)

**Valuation techniques:**

- Shadow prices – used where market prices for a specific impact are not available
  - e.g. housing prices used as a proxy for environmental improvements, or transport link
  - e.g. intangible cost of crime for crime victims
  - e.g. reduced anti-social behaviour from youth club and apprenticeships

# Worked examples (2)

**Quality of Place – examples of themes:**

- Local, easily accessible public services and transport connections
- Good range of easily accessible leisure & cultural facilities
- Strong community groups &activities for young people
- Good healthcare & support for health & well-being
- Built heritage treated as an asset (economic, social & environmental)

# Worked examples (3)

**Example: Valuing health benefits:**

- Rarely just the value of lives lost or saved
- Costs of treatment for conditions, hospital fees, lost output etc.
- QALY: Quality of adjusted life years
- Account for differenced in age, conditions etc.
- Cost savings to the NHS
- & more extreme: Value of prevented fatalities

**CLES Work: Ramblers Association – Walking health impacts**

# Worked examples (4)

**Example: Valuing benefits from asset transfer:**

- Typically applied during options appraisal
- Benefits can include:
  - Economic: staff recruitment & retention
  - Social: local service delivery
  - Environmental: reduced congestion, energy usage
- Be careful about secondary impacts – local quality of environment

**CLES Work: Places for Everyone - Asset transfer impacts**

# Worked examples (5)

**Example: Valuing active travel benefits:**

- Applied before **or** after project
- Beneficiaries & (benefits) can include:
  - Cyclists & walkers (Journey ambience)
  - New individuals cycling or walking (Physical fitness)
  - Car kilometres saved (Travel time, decongestion, accidents, fuel taxes, air quality, carbon reductions)
  - Commuter trips generated (increases in productivity)

**CLES Work: Sustrans – Active travel and links to schools**

# Task

**Task – The benefits from a local employment project**

- DWP guidance suggests a range of factors that should be valued for CBA
- In your groups, discuss which factors you think the guidance suggests are valued
- Why did you decide to include /exclude each factor?

Report back the to the group

Time: 10 minutes

# *Some other thoughts...* (1)

**Assessment of risk**

- Used against options, & to support factors built into CBA
- What is the likelihood of the risk happening?
- How significant is the impact of the risk?
- Who is likely to benefit or be affected if the risk happens?
- Plan your assessment on a risk map...

# *Some other thoughts… (2)*

- Low risks (Green): monitored
- Medium risks (Orange): need contingency plans
- High risks (Red): need radical attention (cancellation?)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Impact | Fundamental | **5** | 5 | 10 | 15 | 20 | 25 |
| | Major | **4** | 4 | 8 | 12 | 16 | 20 |
| | Moderate | **3** | 3 | 6 | 9 | 12 | 15 |
| | Minor | **2** | 2 | 4 | 6 | 8 | 10 |
| | Insignificant | **1** | 1 | 2 | 3 | 4 | 5 |
| | | | **1** | **2** | **3** | **4** | **5** |
| Project: | | | Rare | Unlikely | Possible | Likely | Almost certain |
| | | | Likelihood | | | | |

# Asset transfer example
## (Summary Results)

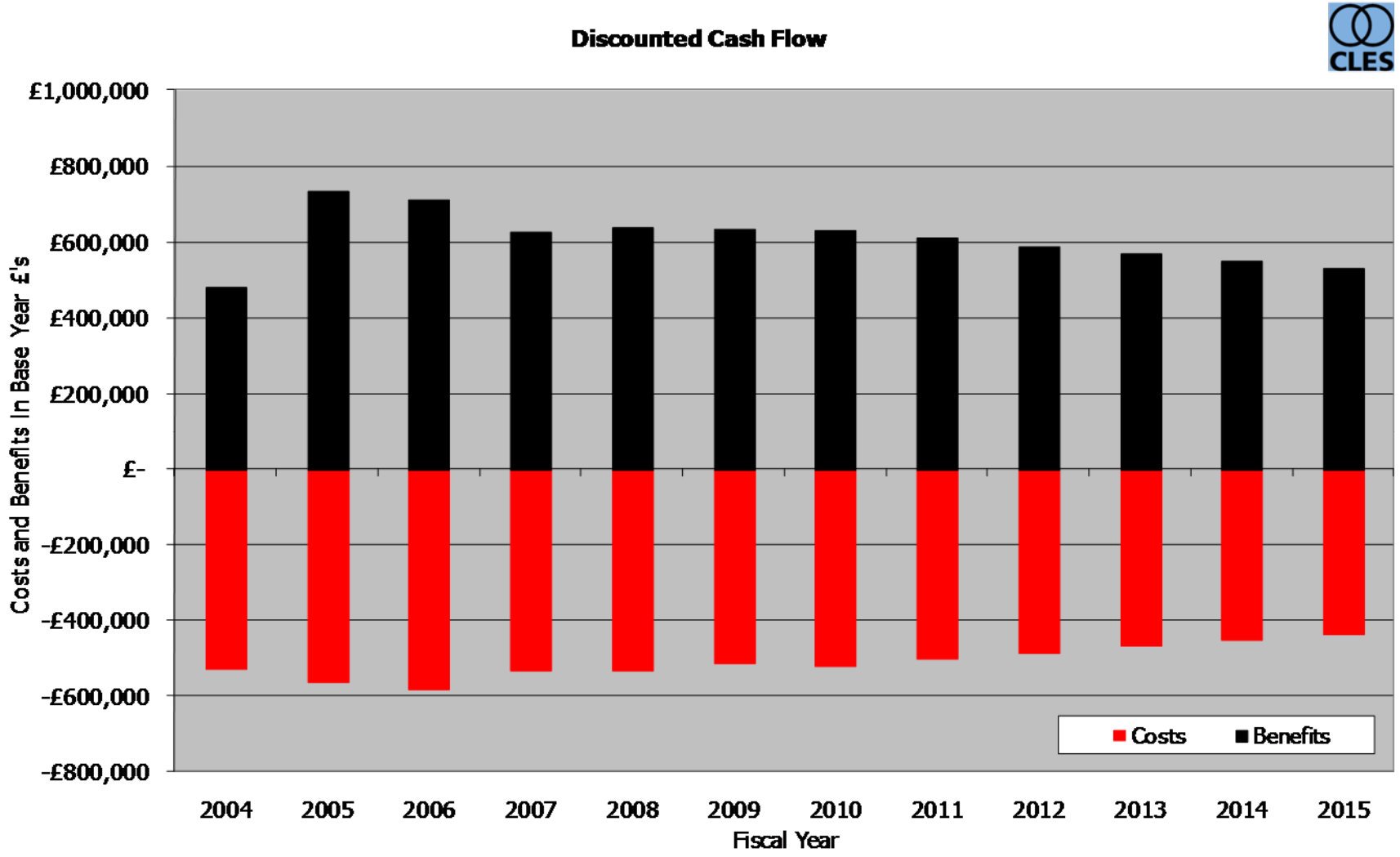
- Benefit to Cost Ratio: For every £1 spent on the scheme, an additional £1.20 returned (discount rate of 3.5%)

| Fiscal Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Undiscounted Flows** | | | | | | | | | | |
| Costs | -£ 526,320 | -£ 582,040 | -£ 621,507 | -£ 588,949 | -£ 610,169 | -£ 608,190 | -£ 637,028 | -£ 637,028 | -£ 637,028 | -£ 637,028 |
| Benefits | £ 483,251 | £ 760,036 | £ 764,571 | £ 694,192 | £ 734,962 | £ 755,704 | £ 778,010 | £ 778,010 | £ 778,010 | £ 778,010 |
| Net Cash Flow | -£ 43,069 | £ 177,996 | £ 143,064 | £ 105,243 | £ 124,793 | £ 147,514 | £ 140,982 | £ 140,982 | £ 140,982 | £ 140,982 |

| Year Index | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Discount Factor* | *1.0000* | *0.9662* | *0.9335* | *0.9019* | *0.8714* | *0.8420* | *0.8135* | *0.7860* | *0.7594* | *0.7337* |
| **Discounted Flows** | | | | | | | | | | |
| Costs | -£ 526,320 | -£ 562,357 | -£ 580,183 | -£ 531,198 | -£ 531,727 | -£ 512,080 | -£ 518,223 | -£ 500,698 | -£ 483,766 | -£ 467,407 |
| Benefits | £ 483,251 | £ 734,335 | £ 713,735 | £ 626,121 | £ 640,477 | £ 636,282 | £ 632,911 | £ 611,509 | £ 590,830 | £ 570,850 |
| Net costs/benefits | -£ 43,069 | £ 171,977 | £ 133,552 | £ 94,923 | £ 108,750 | £ 124,203 | £ 114,689 | £ 110,810 | £ 107,063 | £ 103,443 |
| Cumulative costs/benefits | -£ 43,069 | £ 128,908 | £ 262,460 | £ 357,383 | £ 466,133 | £ 590,336 | £ 705,024 | £ 815,835 | £ 922,898 | £ 1,026,341 |

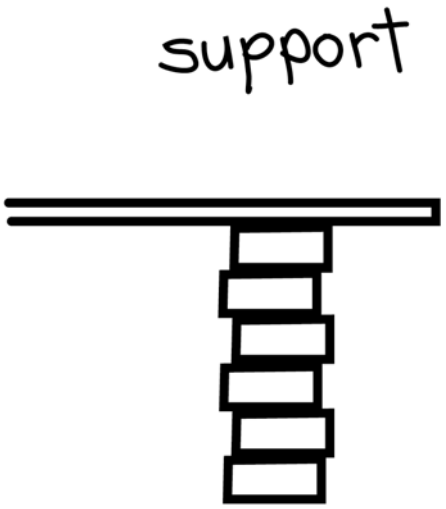
| Discount Factors | |
|---|---|
| Discount Rate | 3.5% |
| Base Year | 2004 |
| Net Present Value | £ 1,222,850 |
| Benefit to Cost ratio | 1.20 |

# Asset transfer example
## (Discounted cash flow)



# Ongoing support from CLES

- Friendly, free advice/information
- Mailing list
- Membership – CLES support/publications/views
- Collaboration – research projects
- CLES Consulting

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