

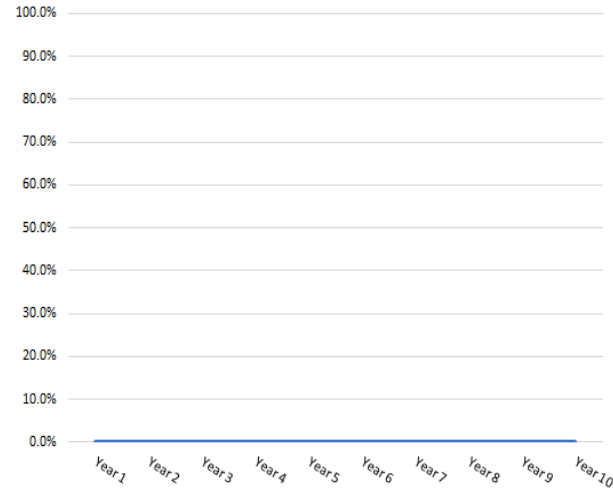
# Traceability CBA Tool

A cost-benefit analysis tool for assessing new traceability systems

## Model results

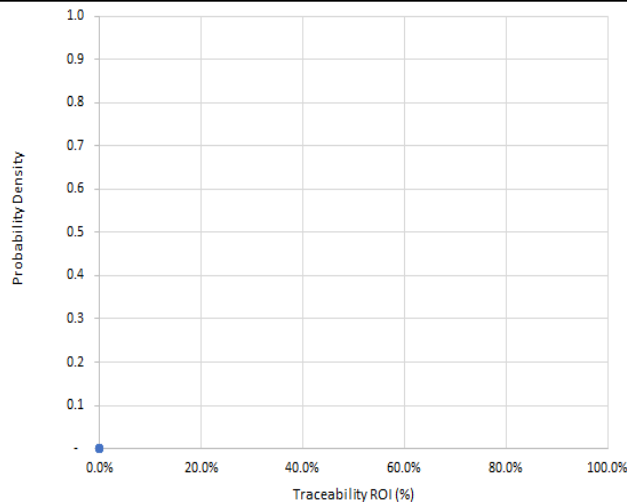
<b>Total ongoing benefits (per year)</b>	<b>\$</b>	-
<i>Additional revenue (less additional associated costs)</i>	\$	-
<i>Reduction in business-as-usual costs</i>	\$	-
<i>Reduction in crisis costs</i>	\$	-
<b>Total upfront costs</b>	<b>\$</b>	-
<i>Imposed by solution providers - initial costs</i>	\$	-
<i>Changes to business - initial costs</i>	\$	-
<i>Assistance for supply chain partners - initial costs</i>	\$	-
<b>Total ongoing costs (per year)</b>	<b>\$</b>	-
<i>Imposed by solution providers - ongoing costs</i>	\$	-
<i>Changes to business - ongoing costs</i>	\$	-
<i>Assistance for supply chain partners - ongoing costs</i>	\$	-
[Input year]-year return on investment (Discounted ROI)		Not computable
Likelihood of a [Input year]-year positive return		Not computable
Upfront return on investment (ROI)		Not computable

## Return on investment (ROI) (%) over time



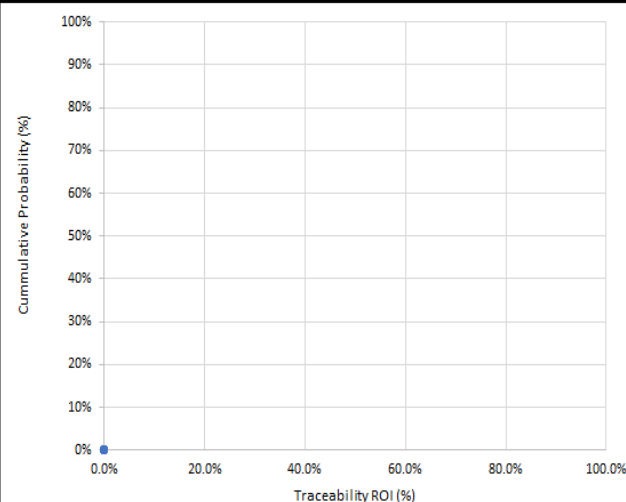
## Probability density - Discounted ROI (%) from implementing traceability system over [Input year] years

The probability density function (PDF) shows the relative likelihood of different ROIs occurring. The area under the PDF between two points on the horizontal axis equals the probability of the ROI falling in this range.



## Cummulative distribution - Discounted ROI (%) from implementing traceability system over [Input year] years

The cumulative distribution function (CDF) shows the probability that the ROI is less than or equal to the corresponding ROI on the horizontal axis.



### Instructions

The Traceability cost-benefit analysis (CBA) tool has been developed to assist Victorian businesses assess the viability of procuring traceability systems. The tool estimates a discounted return on investment (ROI) based on user inputs regarding the costs and benefits of procuring a new traceability system. The accuracy of estimated results depends on the quality of information provided by the user on the *Inputs* page.

The tool comprises two pages: *Inputs* and *Summary*. The *Summary* page generates results based on the entries made on the *Inputs* page. Further instructions on entering data are on the *Inputs* page.

For the *Summary* page results, please note:

Discounted ROI is the return of an investment that occurs over time, controlling for changes in the time value of money/inflation.

The **Model results** panel provides headline results for the potential investment in a traceability system. This is generated by summarising and comparing all costs and benefits associated with the traceability system. These results are a direct representation of the values entered on the *Inputs* page. Only the 'Likelihood of a X-year positive return' metric relies on the *Min*, *Max* and *Uncertainty* values entered.

The **Return on investment (ROI) (%) over time** panel gives the discounted ROI calculated for the period up until and including the year shown.

The bottom two panels represent the uncertainty around the ROI in adopting the described traceability system, as outlined in the *Inputs* tab.

The **Probability density** panel shows the likelihood of different ROI outcomes. The highest part of the curve is the most likely outcome.

The **Cummulative distribution** panel shows the %-probability of the outcome being at or below a certain ROI.

### Methodological assumptions

The results rely on the following assumptions:

**Assumption 1.** The expected number of crises over a five-year period are evenly distributed across that period.

**Assumption 2.** Probability distributions for each variable listed follow a beta distribution. When the *Expected value* equals the midpoint of the *Min* and *Max*, the distribution is assumed to be symmetric. The spread of probabilities between the *Min* and *Max* is driven by the *Uncertainty* input. The table below shows the approximate likelihood of a variable being within 10% of the *Min-Max* gap either side of the *Expected value*.

### Disclaimer

This model has been prepared by Agriculture Victoria for businesses to identify the potential benefits of introducing a traceability system.

Any results presented are generated by the tool and should be considered alongside other information and expert advice. These results are an estimate and should be used for informational purposes only.

Uncertainty	Share of distribution +/- 10% total range from mean
Low	90%
Medium	50%
High	30%

Variable	Description	Expected value	Optional Entries		
			Min	Max	Uncertainty
<b>Business Financials &amp; Model Assumptions</b>					
<b>Business Financials</b>					
Current annual revenue (\$)					
Current annual costs (\$)					
<b>Model assumptions</b>					
Discount rate (%)					
Evaluation period (Number of years after adoption to include in calculations)					
<b>Benefits of implementing a traceability system</b>					
<b>Increased Revenue - Input expected percentage growth in revenue from the below benefits of implementing a traceability system</b>					
<b>Total expected increase in revenue associated with implementing a traceability system (%) - You may fill in a single value to reflect the expected revenue increase, or you can fill in the items below.</b>					
<b>If filling items below, please be careful to not double count revenue increases that may be related between the below impacts.</b>					
ACCESS TO NEW MARKETS	Increases via complying with traceability regulations or retailer requirements (%)				
BRAND VALUE	Increases via targeted marketing, linking customers to their food source, authenticating provenance (%)				
MARKET SHARE	Increases through customer / consumer engagement (%)				
NEW PRODUCT DEVELOPMENT	Increases using customer / consumer feedback surveys to improve or design products more often or more quickly (speed to market) (%)				
PRICING & PURCHASING	Improved consistency in pricing structures and purchasing patterns by importers, wholesalers and retailers (%)				
PRODUCT RANGING	Increased ranging in retail stores (%)				
REPEAT PURCHASING	Increased through better consumer trust and engagement (%)				
OTHER	Any other relevant factors increasing revenue (%)				
<b>The entries above indicate an expected 0% increase in revenue. What costs (excluding traceability costs) would be required to achieve this growth? (%)</b>					
<b>Decreased Costs (Business-As-Usual) - Input expected percentage reduction in annual costs from the below impacts of implementing a traceability system</b>					
<b>Total business-as-usual cost reductions (\$) - You may fill in a single value to reflect the expected cost reductions, or you can fill in the items below.</b>					
<b>If filling items below, please be careful to not double count cost reductions that may be related between the below impacts.</b>					
ACCREDITATION	Decrease from easier electronic certification for customs, biosecurity, food safety, sustainability, welfare etc (%)				
AUDITING & COMPLIANCE	Decrease from streamlining for food safety, biosecurity, phytosanitary, traceability requirements (%)				
AUTOMATION	Decrease from increased digitalisation of current manual business processes, increased integration, increased workforce efficiency (%)				
BRAND PROTECTION	Decrease from reduced food fraud and food substitution (%)				
DATA MANAGEMENT	Decrease from less paperwork, easier real time access of centralised data, easier sharing of data with supply chain partners (%)				
INVENTORY MANAGEMENT	Decrease from reduced time and materials, improved productivity (%)				
MARKETING	Decrease from more targeted marketing toward specific market segments (%)				
PACKAGING	Decrease from less packaging, less wastage, improved recycling (%)				
QUALITY PRESERVATION	Decrease from reduced food waste via better cold chain management, storage, handling and transit, retail shelf rotation and consumer post-purchase communication (%)				
REJECTIONS	Decrease from reduced product rejection by customs or customers (%)				
SUPPLY CHAIN LOGISTICS	Decrease from increased visibility and data generation. Better identification of bottlenecks. More targeted, real-time and improved logistics, retail and sales channels choices. (%)				
INSURANCE	Decrease from reduced annual insurance premiums for product or public liability, through better quality control or recall ability (%)				
OTHER	Other cost decreases expected (%)				
<b>Decreased Costs (Crisis) - What reduction in crisis costs will a traceability system deliver?</b>					
CLAIMS	With current system - Expected cost of experiencing a claim/lawsuit (\$) With current system - Expected number of claims/lawsuits over a 5-year period With traceability system implemented - Expected cost of experiencing a claim/lawsuit (\$) With traceability system implemented - Expected number of claims/lawsuits over a 5-year period				
RECALLS	With current system - Expected cost of experiencing a recall (\$) With current system - Expected number of recalls over a 5-year period With traceability system implemented - Expected cost of experiencing a recall (\$) With traceability system implemented - Expected number of recalls over a 5-year period				
BIOSECURITY OUTBREAKS	With current system - Expected cost of experiencing a biosecurity outbreak (\$) With current system - Expected number of biosecurity outbreaks over a 5-year period With adopted implementing a traceability system - Expected cost of experiencing a biosecurity outbreak (\$) With adopted implementing a traceability system - Expected number of biosecurity outbreaks over a 5-year period				
WEATHER / NATURAL DISASTER	With current system - Expected cost of experiencing a weather event / natural disaster (\$) With current system - Expected number of weather events / natural disasters over a 5-year period With adopted implementing a traceability system - Expected cost of experiencing a weather event / natural disaster (\$) With adopted implementing a traceability system - Expected number of weather events / natural disasters over a 5-year period				
<b>Costs of implementing a traceability system</b>					
<b>SOLUTION PROVIDERS - Costs imposed by the traceability service provider</b>					
<b>Initial Costs (\$) - You may fill in a single value to reflect the initial costs of the service provider, or you can fill in the items below</b>					
INSTALLATION / SET UP	Cost to set up system in first year, tailored to your business (\$)				
MICROSITE / MOBILE WEB APP	Including design features e.g. authentication, variety features, producer story, recall function, surveys, games, recipes, promotions, social media / web links, language translation (\$)				
DASHBOARD	Dashboard with display of all producer and product key data elements, scan results, survey feedback, integrated data monitoring from loggers etc. (\$)				
LABELLING	Labelling including design, label codes, unique serialised printing, call to action, language translation (\$)				
SITE VISITS	For assessment, implementation and training (\$)				
TRAINING	Staff training, new standard operating procedures (\$)				
TRACEABILITY STANDARDS	Traceability Standards implementation, membership, location or product codes costs (\$)				
LOGGERS	Loggers for real time tracking of temperature, location (\$)				
ISOTOPE OR BIOCHEMICAL TESTING	Baseline isotope or element testing of product, for use in future food substitution claims (\$)				
EQUIPMENT	Printers, scanners, labelling materials, cabling, servers, API connections etc (\$)				
CUSTOMISATION	Any further customisation of provider's standard service (\$)				
OTHER	Any other upfront costs imposed solution provider (\$)				
<b>Ongoing Costs (\$) - You may fill in a single value to reflect the ongoing costs of the service provider, or you can fill in the items below</b>					
SUBSCRIPTION	Annual subscription fee (\$)				
SERVICE	On-call service fee (\$)				
UPGRADES	Upgrade fees (\$)				
CONSUMABLES	Labels, loggers etc. (\$)				
OTHER	Any other upfront costs imposed solution provider (\$)				
<b>BUSINESS - Costs facing your business (excluding those imposed by the service provider) in order to integrate the new traceability system</b>					
<b>Initial Costs (\$) - You may fill in a single value to reflect the total upfront cost, or you can fill in the items below</b>					
PRINTERS	Printer upgrades required e.g. inline printers (\$)				
LABELLERS	Printer / labeller / scanner combinations (\$)				
SCANNERS	Scanners - handheld or archway / door frame / gate / tower (\$)				
EQUIPMENT	Other one-off equipment not provided by solution provider e.g. labelling materials, cabling, servers etc. (\$)				
INTEGRATION	Integration, API connections (\$)				
SOFTWARE	Software upgrades and/or licensing (\$)				
LABOUR	IT team, Marketing team, Operational team (\$)				
TRAINING	Staff training, new standard operating procedures in-house and for supply chain partners to promote traceability practices and label scanning (\$)				
MARKETING	Marketing to consumers and supply chain partners to promote traceability awareness and label scanning (\$)				
CHANGEOVER	Cost to change operational processes and reduced workplace productivity during implementation (\$)				
OTHER	Any other upfront costs unrelated to solution provider (\$)				
<b>Ongoing Costs (\$) - Please input the value of any ongoing costs you expect your business will face in using the traceability system (excl. service provider costs)</b>					
<b>SUPPLY CHAIN PARTNER - Costs your business is expected to incur from integrating the new system with the systems of supply chain partners</b>					
<b>Initial Costs (\$) - You may fill in a single value to reflect the total upfront cost, or you can fill in the items below</b>					
MOBILE WEB APP / SCANNERS	Scanners or app design for any supply chain partners e.g. harvesters / pickers / logistics etc. (\$)				
INTEGRATION	Integration, API connections etc. (\$)				
SOFTWARE	Software upgrades and/or licensing (\$)				
CHANGEOVER	Cost to change operational processes and reduced workplace productivity during implementation (\$)				
OTHER	Any other upfront costs incurred by supply chain partners which the business will pay for (\$)				
<b>Ongoing Costs (\$) - Please input the value of any ongoing costs you expect relating to supply chain partners</b>					

**Instructions:**

This page seeks user-inputs to generate the model results. There are four columns for user input: *Expected value*, *Min*, *Max*, and *Uncertainty*.

The columns *Min*, *Max*, and *Uncertainty* are optional fields. Completing these fields generates results on the *Summary* page on the probability of different ROI outcomes occurring. Below is a further explanation of each column:

**Expected value** – For each of the listed variables, this is the column in which the most likely outcome is entered.  
(E.g. If adopting new traceability processes is expected to increase annual revenue by 1%, the user inputs '1%' under the Expected value column)

**Min** (optional entry) – The expected minimum possible value for the given variable.

**Max** (optional entry) – The expected maximum possible value for the given variable.

**Uncertainty** (optional entry) – The user's uncertainty regarding the expected value. Entering Low indicates confidence that the expected value (or close to) is highly likely, while High indicates greater uncertainty. In the High case, the outcome probabilities are more evenly distributed between the Min and Max values.

It is also important to note that when filling in benefits and costs, the user may either fill in the group total benefit/cost, or enter values for the individual elements listed. If the total values are filled, the model will ignore any of the more granular variable data provided.