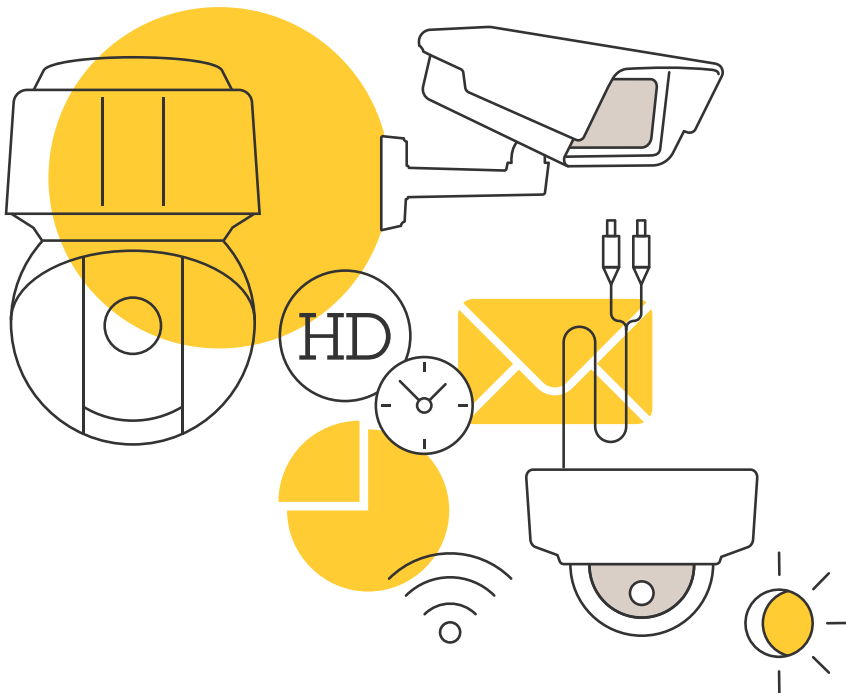


Better insight for better business decisions

Leveraging total cost of ownership (TCO) and return on investment (ROI) in video surveillance systems.

June 2023



Executive summary

Total Cost of Ownership (TCO) is an established concept in many industries as a model to estimate costs across a system's lifecycle.

In this paper, Axis presents a TCO model and overall experiences from applying the TCO in real customer installation. The analysis shows among other things that about 30% of the total cost is made up of investments before the system starts up, and around 70% occurs the operation of the system.

We introduce the concept of value created by the system. By weighing the expected value against the total cost, it is possible to estimate the ROI of the system during its lifespan.

We look closer at three case studies where the TCO and ROI concepts have been used to analyze real video surveillance installations. The cases show a significant return on investment with a break-even occurring very quickly during the system lifecycle.

TCO and ROI are useful tools when calculating projects or assessing tenders. They indicate areas to focus on to reduce costs, they give a foundation to compare tenders from different vendors, and they allow decision makers to better understand the complete costs and value they can expect from an IP security system.



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1. Introduction

1.1 Total cost of ownership (TCO) insight for better business decisions

Imagine you are responsible for a safe city project, and you are tasked with deploying a multi-million dollar video surveillance system. Where would you start? How would you evaluate tenders? How would you assess upfront costs in relation to the long-term operating costs? And which areas of the system should you focus on to optimize its total lifecycle cost? These are just some of the questions you need to ask to minimize risk and avoid unpleasant surprises once the system is deployed.

There is a tendency to estimate the total system cost based only on the initial investment, or in other words, to include costs that happen before the system starts up, but underestimate the costs incurred during system operation. A TCO analysis can help 'unlock' these costs.

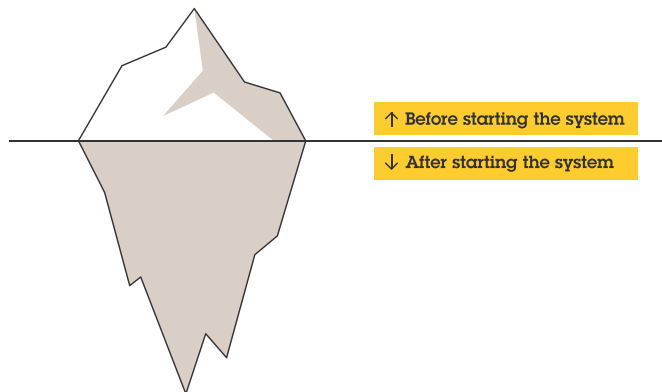


Figure 1. Many costs are 'hidden' during operation of a system but are important in the TCO.

1.2 Definition of TCO

TCO is a financial estimate model that intends to capture all the costs associated with an activity over its complete lifecycle. TCOs are used in many industries as a tool to correctly estimate the direct and indirect costs of deploying a system, and as a tool to compare different systems with different characteristics and cost distribution.

In this white paper, the Axis definition is: quantify a selection of relevant costs associated with a video surveillance solution throughout its complete lifecycle.

1.3 Purpose of a TCO – how can it be used?

A TCO when included in any financial analysis, provides a cost basis for determining the total economic value of an investment and as a product/process comparison tool. A TCO can:

- > help project teams understand how the cost is distributed over time from installation to operation and decommissioning
- > help to understand the distribution of costs between different system components
- > minimize the risk of unforeseen costs that can erode budgets
- > help to focus efforts and reduce costs over time
- > help during discussions with stakeholders about long-term perspective and lifetime expectancy of a system
- > be a contributing factor, out of many, when evaluating project tenders

1.4 Introducing ROI and customer value

Another benefit of having a solid TCO calculation is that it forms the basis for estimating the value of the system, or the Return on Investment (ROI).

What this value is depends on the industry, the customer, the application and many other factors. In the security industry, there are some obvious values that most buyers would identify, such as reduced theft and vandalism. Other key benefits from an IP security system can include increased – real or perceived – safety for citizens, customers or staff, and business and process improvements in for example retail and manufacturing industry.

ROI is typically expressed as a percentage, and calculated with this formula:

$$\text{ROI} = \frac{\text{Value from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

2. Our TCO model

2.1 The lifecycle phases of a surveillance system

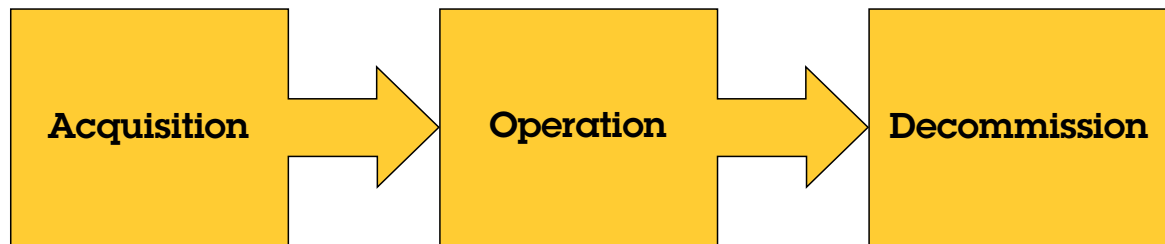


Figure 2. The lifecycle of the system

To create a simple overview of all the costs that affect the TCO of a video surveillance solution, the cost factors have been categorized according to the activities and chronological order in which they appear throughout the system lifecycle. The ownership of a product can be divided into the phases: acquisition, operation and decommissioning. Following these phases, the costs are then divided into three main categories: total cost of acquisition, total operating cost and total decommissioning cost.

The costs in each of the main categories vary in nature. While the acquisition costs and the decommissioning costs only occur once, the operating costs occur continuously throughout the system lifecycle. The size of the operating cost is then heavily dependent on the expected length of the system service time.

2.2 Examples of upfront costs in a TCO

As stated above, some upfront costs are obvious when purchasing a surveillance system, since they typically occur during the first phase of system deployment. For example:

- > Hardware investment
- > Software investment
- > Costs for warranties
- > Installation and integration cost
- > User education

However, these are only a few of the costs that can be incurred during a systems lifecycle – there are many more to consider.

2.3 Other costs to consider in a TCO

Many costs in a TCO are more difficult to estimate, and they will vary considerably between industries. Consider for example the costs for alarm failures and system downtime. For example, in an airport, if the surveillance system fails, it could lead to very high costs as extra security guards may need to be dispatched, or flights might be delayed. In a retail store, a failed surveillance system may impact the ability to prosecute perpetrators for fraud and shrinkage, leading to substantial losses. In some city surveillance situations, camera maintenance crews need to be accompanied by police or guards when going out on site, which would increase the downtime costs substantially.

These are some examples of costs that are important but more difficult to estimate for a TCO:

- > Business costs from system downtime
- > Freight
- > System inspection
- > Insurance
- > Server room
- > Cybersecurity
- > Legal and fines

3. Experiences from TCO of real system installations

At Axis, we have now for several years used the TCO approach in real installations. We have sat down with customers in USA, Brazil, Argentina, UK, France, Spain, Kenya, South Africa, UAE and India – to name a few – and analyzed their system costs: from purchasing to installation, maintenance and operation.

3.1 Overall findings

While there is obviously variation between the installations, there are some clear trends across the different TCO cases. For example, the TCOs show that typically the costs before system start make up around 30% of the total cost of ownership, while 70% of the costs occur during operation. Operational costs include for example monitoring, maintenance, failure costs and electricity. This conclusion is particularly important due to the tendency of buyers to concentrate on the purchasing and installation costs, as stated above.

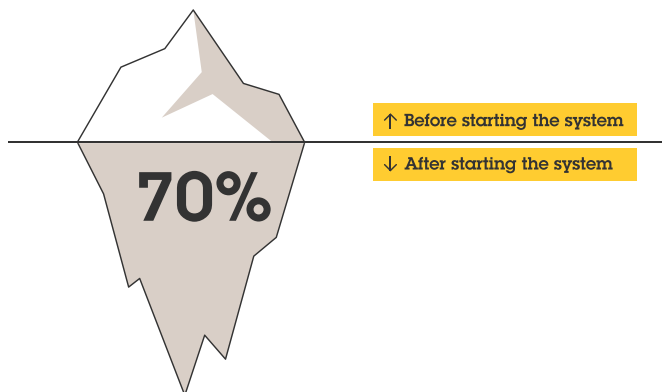


Figure 3. Operational costs typically account for 70% of the TCO.

With the kind support and permission of the customers and Axis partners, we can in the next sections present a more detailed analysis of three cases, including the long-term cost of ownership of these installations, as well as the value created by the IP systems.

3.2 TCO applied in a smart city installation



Vicente López is situated in the northern section of the greater Buenos Aires area in Argentina, with a population of approximately 300,000. In order to create a secure environment for its citizens, the local government has deployed a large video surveillance solution based around Axis cameras.

3.2.1 TCO for Vicente López



A TCO analysis was conducted of this 1,500-camera project, calculated over a 10-year expected lifecycle. The analysis revealed a TCO of around USD 29,000,000. The analysis shows among other things that about 34% of the total cost is mainly made up of investments in hardware and software, and 66% occurs during installation, maintenance and operation.

The largest costs are the system operating cost and the contract cost. Other relevant costs are the overhead cost and the maintenance cost, which all together make up for 15% of the TCO. The significant overhead costs in the TCO are mainly due to the continuous training of new personal (e.g. operators).

The TCO cost distribution for the main categories of the system is shown below.

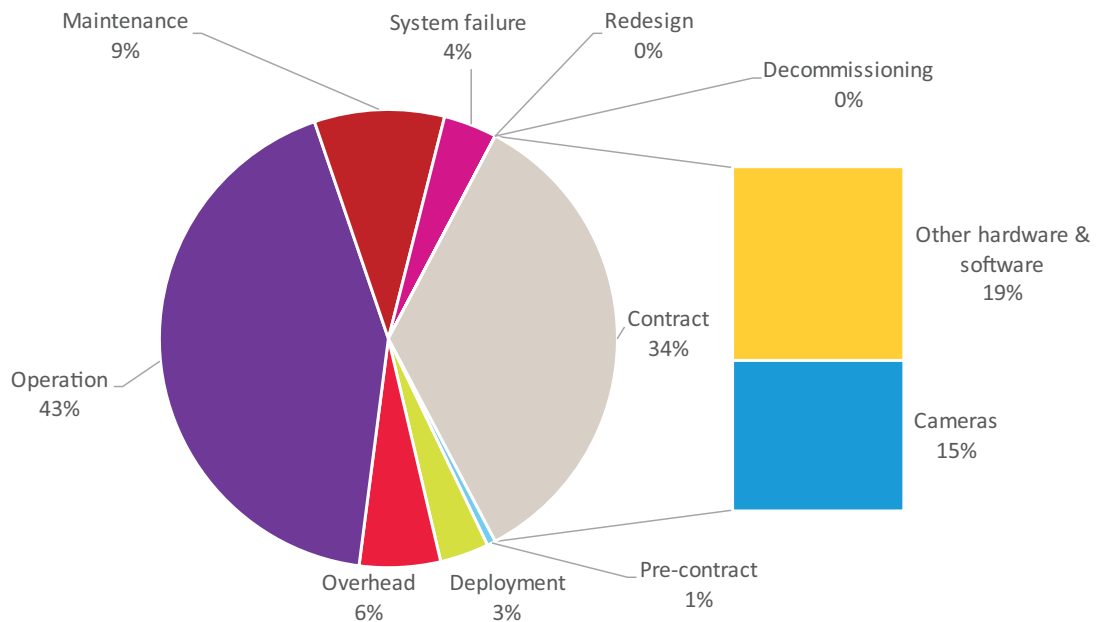


Figure 4. TCO for Vicente López.

3.2.2 Conclusions and observations for Vicente López

Some cost factors have not been taken into account, for example, the costs for alarm failures and costs incurred in the business operation due to system downtime. The costs for staff monitoring the system have also been excluded, which of course are substantial in a city surveillance installation.

The benefits of the system include much faster response time for emergency staff, smoother traffic flow and overall a better sense of security for its citizens. Quantifying these benefits are of course challenging and the exact ROI difficult to determine – probably not unusual in a city surveillance project.

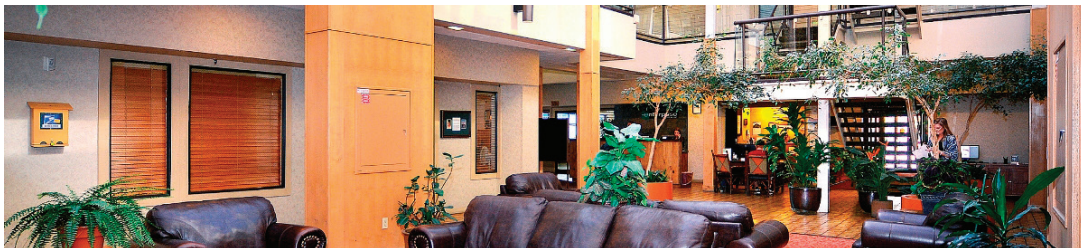
One additional benefit of the TCO analysis is that it has allowed the city managers of Vicente López to better forecast the costs of the system, and to have a concrete and constructive dialog with other decision makers in the municipality regarding budgeting and future expansion of the system.

3.3 Saving costs in the hotel industry



Christie Lodge is a hotel facility in Avon in the Rocky Mountains of USA. To protect its customers, staff and assets, Christie Lodge has deployed an AXIS Camera Station-based video surveillance solution with around 40 Axis cameras.

3.3.1 TCO for Christie Lodge



This TCO study of the Christie Lodge in Avon, Colorado, USA, calculated on an expected 7-year lifespan. Based on the time and money spent in preparation, installation, operation and maintenance of the system, the estimated total cost of ownership for Christie Lodge will arrive at USD 91,000 over seven years.

About 54% (USD 50,000) of the TCO are acquisition costs and relates to planning, equipment purchase, installation and training. 44% (USD 40,000) of the TCO are operating costs covering operation, maintenance and failure. Around 2% of TCO (USD 2,000) were estimated as final decommissioning costs. Monitoring costs have been excluded in the TCO.

All in all, the system costs around USD 5,600 per year.

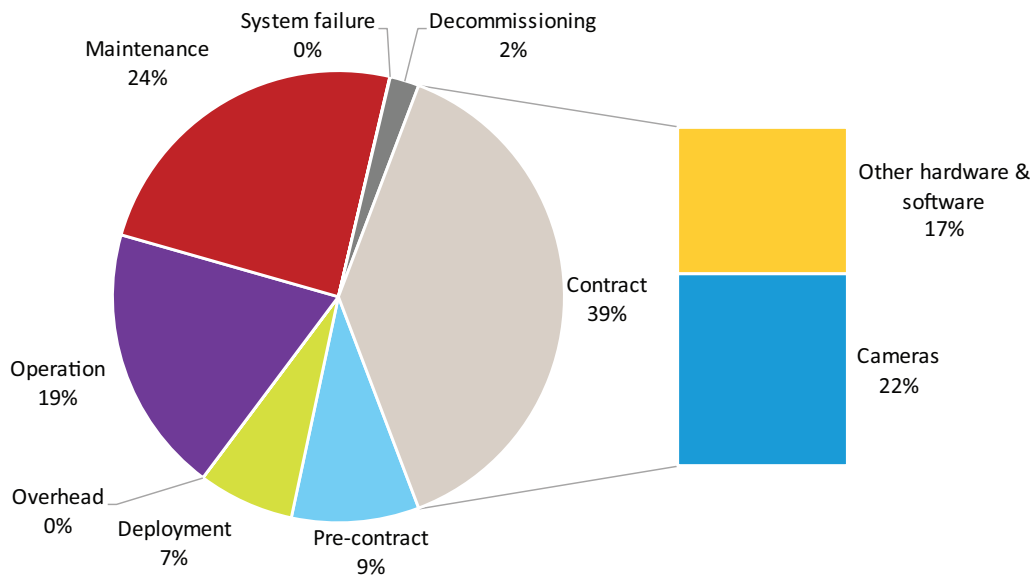


Figure 5. TCO for the Christie Lodge hotel facility.

3.3.2 ROI for Christie Lodge

Christie Lodge has experienced numerous benefits of its surveillance system. Staff feels more secure, and the video has been used to clear up a number of guest complaints, car incidents and even a couple of burglaries committed at properties bordering Christie Lodge. But the main savings for Christie Lodge has come from two sources: reduction of its rented security staff, and battling liability claims.

Before the deployment of the Axis system, Christie Lodge used to have a security person patrolling the site 16 hours per day, but with the surveillance system up and running they have reduced that to having a security guard on site for eight hours each night to guard the reception and walk around the property.

Furthermore, Christie Lodge is from time to time approached with liability claims. The typical cases are so called "slip and fall" cases where individuals claim to have slipped and injured themselves e.g. on carpets, in stairs, or in the parking lot; and then requesting compensation from Christie Lodge for medical expenses etc. Before the video surveillance system was installed, Christie Lodge had limited possibilities to question these types of claims. Now, however, the high-quality video allows them to look at each accident and separate the valid claims from claims that are more or less fraudulent.

Altogether, Christie Lodge estimates that they save around USD 40,000-USD 50,000 each year with the new system. This means that the investment paid off already at the end of second year of operation, creating an ROI at the end of year seven of no less than 257%. See below.

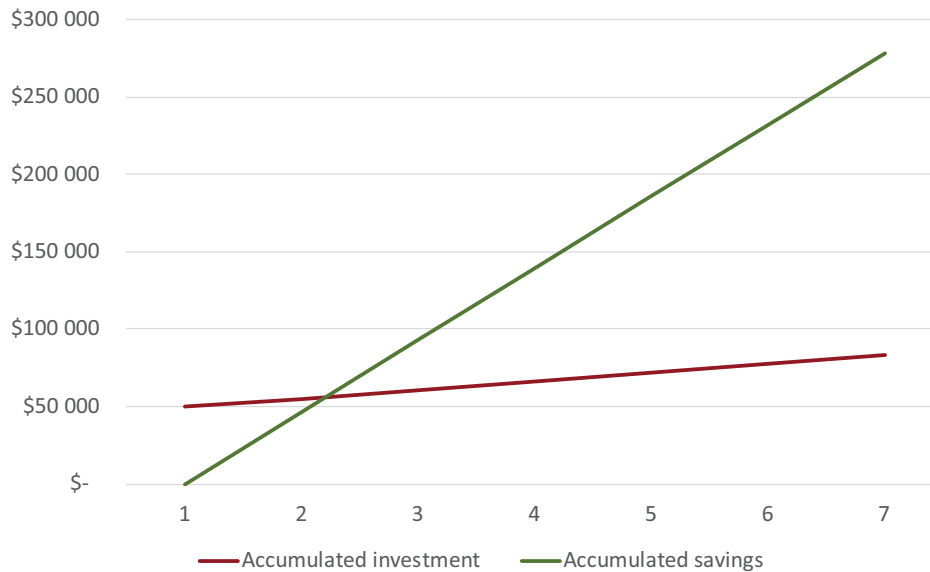


Figure 6. ROI for the Christie Lodge hotel facility.

3.4 Significant ROI from reducing retail shrinkage



RC Willey in Salt Lake City, USA, is a leading home furnishings retailer with retail outlets and distribution centers spread across western USA. They have deployed an enterprise video surveillance system with 800 Axis cameras, installed in stores and in the distribution centers.

3.4.1 TCO for RC Willey



With a seven-year expected lifespan of the system, the total cost of ownership for RC Willey was calculated to be around USD 1.39 million.

About 76% (USD 1.05 million) of the TCO happens during acquisition and relates to planning, equipment, installation and training. 23% (USD 340,000) of the TCO covers costs for operation, maintenance and failure. Around 1% is an estimation of the decommissioning cost. Monitoring costs have been excluded in the TCO.

The yearly cost for running the system is slightly above USD 46,000.

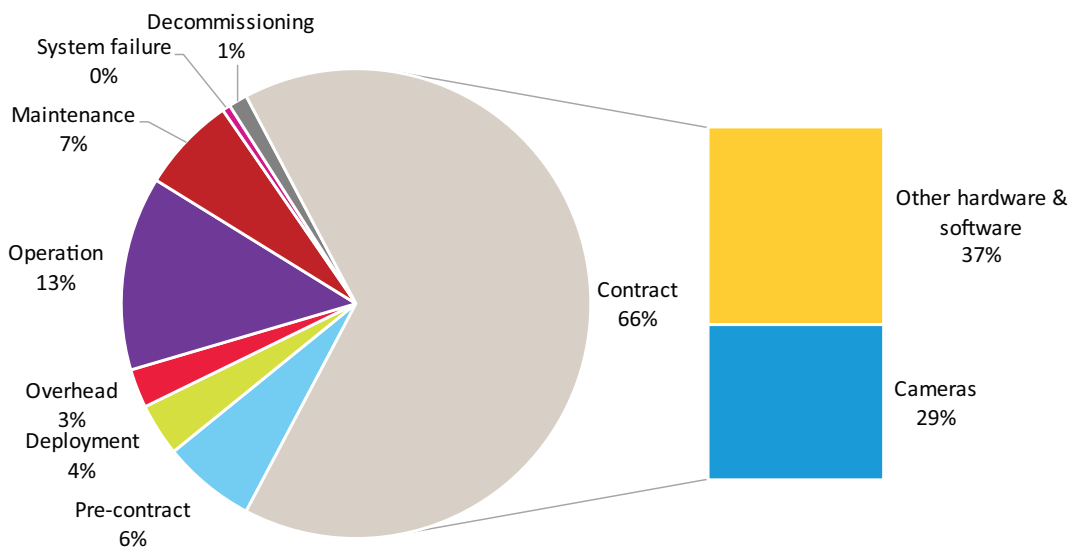


Figure 7. TCO for RC Willey furnishings.

3.4.2 ROI for RC Willey

The main savings for RC Willey from the video surveillance system comes from reduced shrinkage. They have experienced a drastic reduction in shrinkage, and the customer attributes that reduction primarily to the new camera system and its area coverage and high-quality video recordings.

In addition, RC Willey has used the system to mitigate litigation claims. As a successful retailer, they are approached every year with a number of substantial "slip and fall" claims, where customers claim that they have injured themselves in or around the stores. These claims can be as high as USD 100,000 or more. Thanks to the high-resolution video, RC Willey can now prove exactly what has transpired in each case. This has allowed them to battle false claims, and reach fairer settlements in other situations.

RC Willey estimates that the yearly savings from the Axis video surveillance system is around USD 5.7 million. With an upfront investment of USD 1.05 million and a yearly cost of USD 46,000 this means that the cost of the system is saved already in the first year, and the final ROI after seven year arrives at no less than 2,768%. See below.

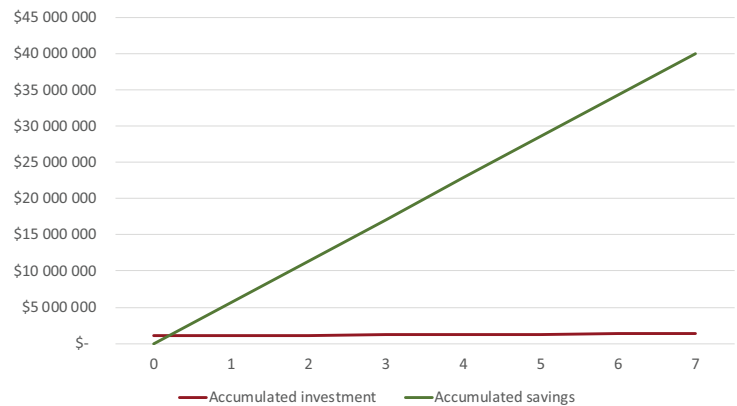


Figure 8. ROI for RC Willey furnishings.

4. Conclusions

Axis has a tested TCO model that we have applied across many customers installation.

Overall, our experiences show that 30% of costs occur before system start up, while 70% occur during operation.

A TCO like the one presented here can be a useful tool when calculating projects or assessing tenders.

It presents examples of costs which can be expected during the systems lifecycle, and indicates areas to focus on to reduce costs and improve the quality of the surveillance solution.

TCOs and ROIs also help you estimate the value the system could deliver. Including a TCO and ROI perspective in your buying process can help you evaluate competing offers. For instance, to determine if a high-quality solution that is more expensive upfront will save costs and deliver more value in the long term.

The case studies show a ROI where the systems essentially pay for their own costs within one or two years.

If you are interested in learning more about TCO or ROI, or to discuss your project requirements, please contact your nearest Axis representative, which can easily be found on www.axis.com/contact-us



About Axis Communications

Axis enables a smarter and safer world by creating solutions for improving security and business performance. As a network technology company and industry leader, Axis offers solutions in video surveillance, access control, intercom, and audio systems. They are enhanced by intelligent analytics applications and supported by high-quality training.

Axis has around 4,000 dedicated employees in over 50 countries and collaborates with technology and system integration partners worldwide to deliver customer solutions. Axis was founded in 1984, and the headquarters are in Lund, Sweden.

For more information about Axis, please visit our website www.axis.com.