Telstra's Video Miles Trial

Quantifying Carbon and Productivity of Video Conferencing across Telstra

November 2009

A collaborative initiative between

Telstra's Corporate Environment Group

Telstra Product Management

Telstra Enterprise & Government

Telstra Network & Services

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1. Executive Summary

Video Conferencing (VC) provides a range of tangible and intangible benefits to business. The quantification of these benefits provides important information to enable customers to better understand and maximise the value of their VC solutions. Of particular interest is a reduction in the need for travel, leading to a reduction in costs and carbon emissions (CO_2e) in conjunction with improved productivity from time savings.

A three month[1] trial was undertaken of Video Miles (VM), a software tool used to capture VC data and calculate utilisation and travel savings[2] for individual VC end points, for 13 licensed units across Telstra. The tool collected call records from each VC end point and the number of meeting attendees who indicate whether they were substituting the VC for physical travel. Where possible, this 'substitution' data was captured on the end point when the VC was initiated, although due to a technical issue some units required use of a manual alternative.

For the trial, the use of eight VC end points saved **$62,362** and approx **100 tonnes CO_2e** creating potential annual savings of almost **$250,000**. This was calculated based on 305 individuals who avoided **1,420 hours** of business travel[2]. Based on data from 12 of the 13 VC end points, the average utilisation was **6.4 hours per week** with the top four units averaging **13 hours per week**. Based on VC end point availability of 40 hours per week, this equates to only 16% and 33% utilisation respectively which is low. Trial results extrapolated to the 89 High Definition (HD) VC units identified across Telstra by the June 2009 VC audit indicate current annual travel savings extends to **$1.47 million**. The direct costs for the VM software totalled $5,385[3].

There were seven recommendations from the trial with the following three identified as priorities for Telstra:

- Implement VM (or comparable solution) across Telstra promptly[4], leveraging the current opportunity for Telstra to be an industry leader with measurement of VC travel savings.
  <u>Recommendation owner</u>: Workforce Productivity.

- Calculate the operational energy costs and CO_2e emissions generated by each VC end point model to calculate the broader operational impacts of the video conferencing[5].
  <u>Recommendation owner:</u> Telstra Enterprise and Government (TEG) & CEG.

- Incorporate VM (or comparable solution) quantification capabilities into the VC product offering / roadmap to customers.

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[1] August, September and October 2009.
[2] Air and road travel only.
[3] Full cost breakdown can be found in Appendix 2: Video Miles Cost Break Down.
[4] Include mitigation of issues identified during the trial, discussed in 5.4 Issues, Impacts & Mitigation.
[5] With particular regard to the high energy use units such as the Polycom RPX.

<u>Recommendation owner:</u> Telstra Product Management (TPM).

This trial produced valuable results and insights with only a small number of VC units. While it raises further questions regarding VC units, it more broadly serves to demonstrate the value of quantifying the travel emissions, time and costs avoided from VC.

2. Background

The ability to clearly and easily capture video conference (VC) utilisation and travel savings in terms of cost, time and emissions is extremely valuable. Such quantification enables the business to more accurately understand the tangible value of each individual video conference unit and associated bandwidth[6]. Furthermore it provides evidence to publicly support Telstra's travel and emissions reduction capabilities, both internally and for our customers. This demonstrates industry leadership.

Use of ICT solutions to drive sustainability and deliver business value through cost savings, productivity improvements and enhanced value for employees, is recognised across Telstra. In April 2009, TEG launched an ICT Sustainability White Paper[7] and Return on Investment (ROI) tools to aid customers in understanding the value of ICT solutions. Internally, the Workforce Productivity Group is leading identification and implementation of ICT solutions for Telstra. This in turn provides Telstra with real life examples to showcase the benefits of these solutions to customers. In addition, these solutions contribute intangible attributes of Telstra's Employee Value Proposition such as work life flexibility and the environment.

Telstra's travel spend[8] for the 2008-2009 financial year surpassed $31 million of which 71% was domestic. The greenhouse gas emissions from the air travel alone were almost 34,000 tonnes CO_2e[9]. Telstra's Corporate Environment Group (CEG) is focused on how Telstra's products and services, such as VC, can enable both Telstra and our customers to reduce their emissions. In June, the CEG jointly conducted a company-wide audit of Telstra's VC units, identifying and communicating details of 161 VC units at Telstra, so as to provide a low-emissions meeting alternative to physical travel[10]. The next step was to quantify the emissions abated by video conferencing along with related benefits of cost and productivity savings from reduced travel. This quantification is particularly valuable to support business cases to justify investment or expansion in implementation of this technology.

To quantify VC utilisation and travel savings there are two main data components required. Firstly the call details for each VC end point, including each call duration and the geographic location, are needed. The second required data component is the number of meeting attendees for each VC who would have physically travelled if they were not able to use video conferencing, also referred to at the substitution 'X' factor.

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[6] There are additional non-travel related benefits of video conferencing that are more difficult to capture including the relationship value of face to face meeting and enabling faster time to market for product development.

[7] Full paper found at http://www.telstraenterprise.com/researchinsights/Pages/Sustainability.aspx.

[8] Covers airfares, accommodation and cars.

[9] http://www.telstra.com.au/abouttelstra/csr/docs/corporate-responsibility-report09.pdf , page 41.

[10] For Telstra internal VC end points see
http://www.in.telstra.com.au/ism/internalconferencing/videoconferencing.asp

In February, a cross company VC task force was established to address issues experienced with VC including support structures, processes, network configuration and stability[11]. Currently within Telstra there is no consolidated view or management of all video conference units or recorded call data (whether through a manual or automated solution). Capturing substitution information from meeting attendees is not undertaken at all. To address this challenge, a trial of the VM software, developed by The Visual Environment, was conducted to capture and analyse video conferencing data. The VC task force was critical in enabling this trial to progress.

This trial measurement of emissions avoided using VC is also the basis for calculation of customers' emissions reduction as enabled by Telstra products and services. Beyond the reduction of our own carbon footprint, the broader story for Telstra is the national emissions reduction that is enabled by our network. This is a key priority and deliverable for the Corporate Environment Group[12].

3. Purpose

The purpose of the trial was to:

- Quantify the emissions, time and cost savings from avoided travel by individuals using video conferencing end points as an alternative

- Ascertain consistent VC call details and utilisation down to individual end points

- Provide a tangible demonstration based on data capture of Telstra's contribution to customers' carbon emissions reduction through video conferencing

- Understand the functionality of VM software including the monitoring and decision-making capability and determine its suitability for a Telstra-wide rollout

- Gain technical understand the VM software, identifying any problems or pitfalls

- Determine suitability for product development roadmap and customer offering

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[11] now incorporated into the Workforce Productivity program.
[12] See Project Brief - Customer Emission Quantification, Project Manager Kristina Cockbill for more details

4. Overview

4.1. Implementation

The trial encompassed 13 end point licenses of various Polcyom video conference end points across the country owned primarily by the TEG and TPM business units (see 4.2 End Point list for details). Data was captured for the three months of August, September and October 2009.
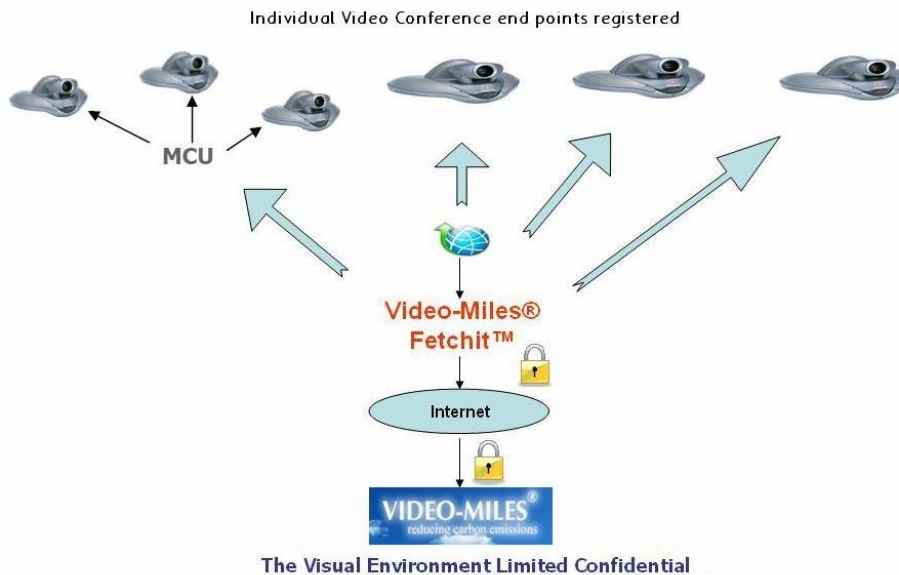

Figure 1 Video Miles trial implementation

The VM software uses a small locally installed piece of software, called a Fetchit, to access the registered VC end points and bridges to download call records at regular, defined time intervals. Meeting attendees nominate the number of people who would have travelled for the meeting if they could not have used video conferencing – the number of 'substitute travellers'. This number is captured on the end point prior to starting the VC using an 'Account Code' field. A manual method was used where the Account Code functionality was not accessible.

The call records, including the number of substitute travellers, are sent over a secure outbound-only link to the VM portal where real time calculations determine the travel savings[13]. These savings along with call details and utilisation numbers can be viewed on the secure portal using a customer login. In addition the portal can be used for basic administration functions and to export the data into a reporting tool.

The trial cost for VM including end point licenses, reporting, support and setup cost $5,385 along with a partial technical Telstra resource. Internal resources costs covered a technical VC specialist, while in house project management,

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[13] VM uses the most inexpensive airfares available with the least number of stops and the latest emissions calculation figures from the Department of Environment and Foreign Affairs, UK.

reporting and documentation were provided by the Corporate Environment Group (Appendix 2: Video Miles Cost Break Down). Additional key business unit representatives and conference room administrators contributed to training, local data capture and communication for their business unit.

Further technical details of the VM implementation are included in Appendix 3: Technical Implementation.

4.2. End Point list

The following VC end points were included in the trial[14]. The 'substitution' column indicates if the number of substitute travellers was captured directly on the end point using the 'Account Code' feature before initiating the conference or whether a manual form was used. The 'Admin' column indicates if the end point has an employee that is responsible for administration / bookings of the room (along with others). Further end points details regarding individual data accuracy are found in Appendix 5: End Point Accuracy and Variance.

BU	End Point	Type	Location	Substitution	Admin
TPM	Electric Room	HDX 8004	Sydney	Manual form	No
TPM	Viper Room	HDX 8000	Melbourne	Manual form	No
TPM	Cobalt Room	HDX 8000	Sydney	Manual form	No
TPM	Room 1	HDX 9004	Melbourne	Manual form	No
TEG	Conf Room Old System	VSX 7000E	Sydney	Account code	No
TEG	Conf Room Media Centre	HDX 8004 XL	Sydney	Account code	No
TEG	Room 3	HDX 8004	Melbourne	Account code	No
TEG	Agnes Sheehan desktop	HDX4002 XL	Melbourne	Account code	No
TNS	Derwent Room	VSX 7000E	Melbourne	Account code	Yes
EBC[15]	RealPresence Room	RPX	Melbourne	Manual form	Yes
EBC[15]	RealPresence Room	RPX	Sydney	Manual form	Yes
EBC[15]	Fremantle Boardroom	VSX 7000E	Perth	Manual form	Yes
EBC[15]	Meeting Room 2	VSX 7000E	Adelaide	Account code	Yes

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[14] All end points are Polycom. Cisco Telepresence were not supported at the beginning of the trial although VM will now integrate with Cisco Telepresence units.
[15] Executive Briefing Centre within the TEG business unit.

5. Findings

5.1. Utilisation

For the months of August, September and October, 12 end points[16] in the VM trial had a total utilisation of almost **965 hours** which is an average of **6.2 hours** per week[17]. However, the top four end points make up more than **71%** of this total at **688 hours**, an average of **13 hours** per week.
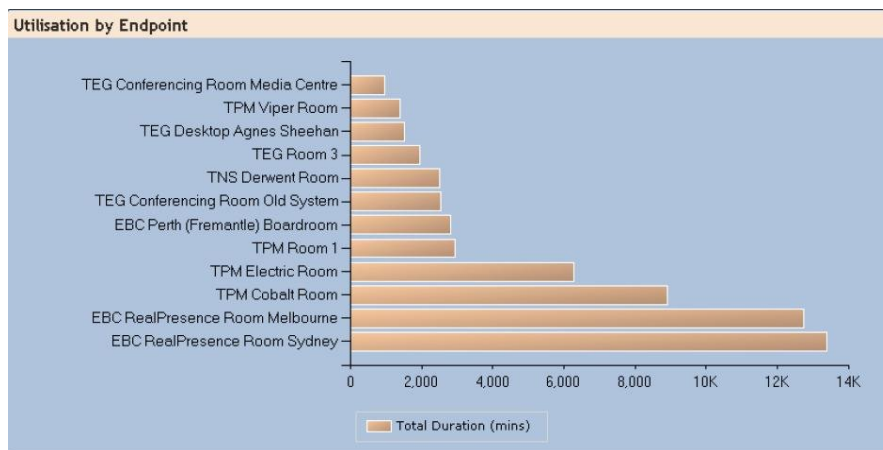

Figure 2 Utilisation for all end points

5.2. Travel Savings

The travel savings calculated by VM include cost, emissions and time savings from the number of meeting attendees who substituted[18] a VC for physical travel, excluding the operational energy use of the VC units. For the months of August, September and October 8 VC end points[19] saved over **$62,000** and **1,420 hours** with an abatement of almost **100,000 kg CO_2e** from avoided travel[20]. The top two end points alone saved more than **$37,500**.

The total number of those attendees who substituted VC for travel during the trial was **305** attendees.

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[16] The 13th licensed VC trial end point did not successfully log call details.

[17] Based on the trial months actually spanning 13 weeks.

[18] Substitution numbers are subjective based on individual attendees' opinions.

[19] Only units with sufficient travel substitution data was capture have been included, see Appendix 5: End Point Accuracy and Variance for more details.

[20] This excludes cost and emissions from equipment electricity use.

Travel Costs Saved	
Month	Travel Savings ($)
August	$16,452
September	$31,997
October	$13,914
Total	**$62,362**

Figure 3 Travel savings by month for eight end points
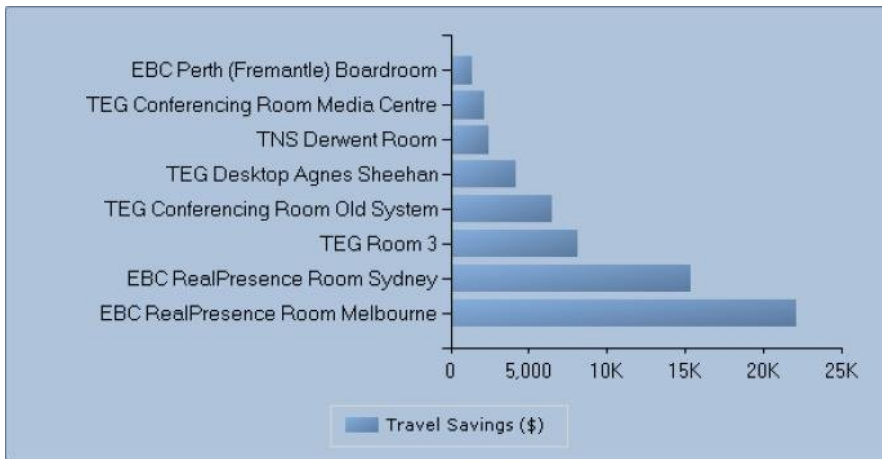

Figure 4 Employees substituting travel

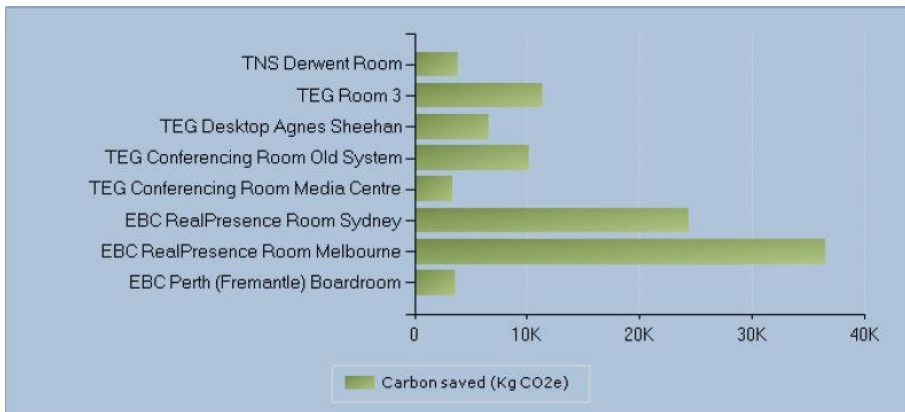Figure 5 Travel cost savings for end points capturing substitutions

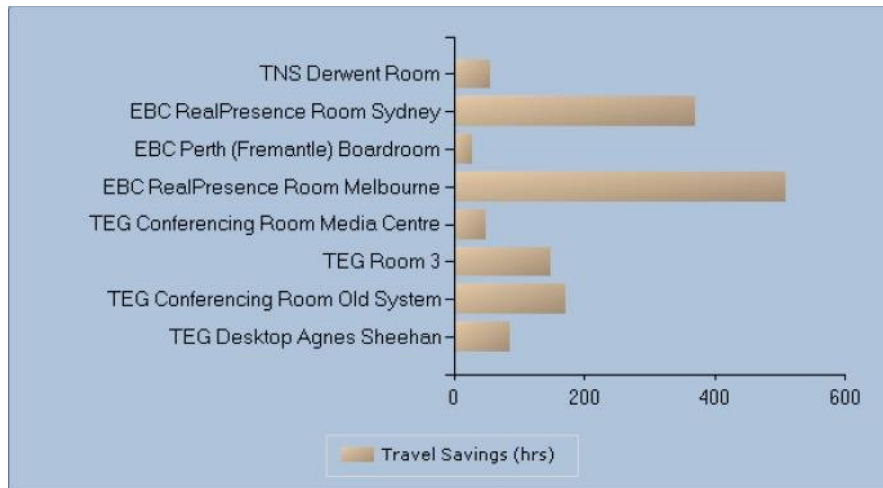Figure 6 Travel carbon savings for end points capturing substitutions

Figure 7 Travel time savings for end points capturing substitutions

Appendix 5: End Point Accuracy and Variance provides a list of each VC end point with additional information about its data accuracy based on impacts from the identified issues on data capture and quality. It includes and indicator or the level of confidence in the data accuracy for trial results along with any unit data that has been excluded from particular trial results in this report.

5.3. Extrapolation and Interpretation

The travel savings results from the trial can be extrapolated to indicate the savings realised from Telstra's current VC end points. The average end point savings were separated into Real Presence and non-Real Presence. These figures were then applied only to the HD end points identified in the June 2009 VC audit. Based on Telstra's 89 HD VC end points, the current benefit from avoided travel extends to:

- Cost savings of up to **$1.47 million**[21]

- Elimination of **2,314 tonnes CO_2e**[22] greenhouse gas emissions

- The equivalent of **12 per cent** of the domestic spend on air and car travel, as measured against 2008-09 financial year figures[23]

Based on six Real Presence or Telepresence units, the current benefit from avoided travel extends to:

- Cost savings of up to **$450,000 per year**[24]

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[21] Using the successfully captured travel savings from the six non-Real Presence end points, refer to Appendix 5: End Point Accuracy and Variance for more details.
[22] Derived from air and car travel emissions only, these emissions would not necessarily be included in Telstra's emissions footprint as they are Scope 3 / indirect emissions.
[23] For FY 08-09 Domestic Airfare costs totalled $11,983,586 and domestic car costs $361,853.
[24] Using travel savings data from two Real Presence units, refer to Appendix 5: End Point Accuracy and Variance for more details.

Similarly, this extrapolation enables the benefits of incremental changes to the VC utilisation and substitution at Telstra to be calculated. For example, a 10 per cent increase in travel savings from Telstra's 89 HD VC units could achieve:

- Additional abatement of **231 tonnes CO_2e**[25] or **5.4 kg per employee**[26]

- Increased annual travel savings of **$147,251**[27] **per year** and **801**[28] **hours** on existing savings

The trial results provide the basis for further VC end point comparisons and interpretations. By leveraging additional information about individual end points it is possible to draw more focused conclusions, particularly in relation to utilisation. Due to the small sample size in the trial no further interpretations were included in this report, although the report recommendations include further VC research and analysis[29]. In addition, an indication of the initial investment and capacity of the different VC end point hardware has been included for broader consideration of the return on investment[30].

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[25] Calculation based on: annualised travel emissions savings per unit is 26,000 kg CO_2e by 10% totalled for 89 HD units.
[26] Based on 42,784 full time staff and equivalents.
[27] Calculation based on: annualised travel savings per non-Real Presence unit of $16,545 by 10% totalled for 89 HD units.
[28] Calculation based on: annualised travel savings per non-Real Presence unit of 90 hours by 10% totalled for 89 HD units.
[29] See Appendix 7: Utilisation Impact and Context Considerations
[30] See Appendix 6: End Point Breakdown

5.4. Issues, Impacts & Mitigation

A number of issues were identified during the trial which had varying degrees of impact on end points through reductions in either data quantity or quality. The majority of issues were resolved and the full list can be found in Appendix 4: Issues, Impacts and Mitigation Complete List. The issues that were not resolved or that should be addressed in future implementations are listed below:

Issue	Impact	Resolved	Proposed Mitigation
AMX controllers[31] not supporting 'Account Code' capture	Prevented meeting attendees entering the number of substitute travellers at the time of dialling into their video conference. Manual forms were used to capture this substitution data with high quality results for units with administrators and poor response for all other units.	No	Enabling of the Account Code feature to each AMX controller used with a licensed VM end point. Testing to ensure no other unwanted impacts or issues. Note: this may mean purchasing an AMX controller for Cisco Telepresence & Polycom RPX units.
RMX bridges could not be successfully registered for multi-point call or use of a bridge for a point-to-point call	All conferences using these bridges were not able to log travel savings as the end point location for the call could not be determined	No	It is mandatory this issue is proven to be resolved prior to any future implementation, so joint work to ensure successful registration and logging to be conducted with The Visual Environment (suppliers of VM).
Travel savings were not recorded for inbound conference calls from end points outside the trial (i.e. not licensed)	The data reflected less travel savings than may actually have occurred, therefore reflecting conservative results. However, these calls were included in the utilisation and call list data. Note: This was particularly high due to the limited number of licensed end points in the trial	No	Review the end points that would be licensed with VM to assess the potential number therefore impact of inbound conference calls from non-licensed end points. Discuss this issue with the product supplier for any alternatives.
Technical end point fault i.e.	The data could not be captured accurately	No	Ensure there are no technical issues with

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[31] An AMX controller is a third party device used to provide enhanced functionality and incorporates the control of the video conference unit. The Account Code feature is used by VM to capture the number of substitute travellers was not configured on the AMX controller.

Issue	Impact	Resolved	Proposed Mitigation
not able to remember date/time when turned off.	and due to the age of the equipment there was no hardware support arrangement to have it fixed.		equipment licensed for VM and consider the age of the unit and associated hardware support arrangement.

6. Conclusion

The trial of VM software successfully captured quality information to quantify utilisation and travel savings from the use of VC. The VM trial outcomes provide valuable information and insights into current VC usage and savings. The combination of trial results and additional end point information (i.e. from the VC audit) enables improved understanding of the value of video conferencing end points. Importantly, this trial demonstrates the value of quantification for both Telstra and our customers.

Overall during this trial, **$62,362**[32] was saved from avoided travel, **1,420 hours** were not spent travelling and almost **100,000 kg** CO_2e emissions were not released into the atmosphere from the use of eight VC units. These savings resulted from **305** people choosing to use video conferencing instead of travelling.

VC utilisation, averaged across 12 end points, was **6.2 hours per week**, with the top four end points using an average of **13 hours per week**. The top two (Real Presence) end points were used an average of **17 hours per week**. Extrapolation of the travel savings across all Telstra HD VC end points[33] indicates up to $1.47 million[34] are avoided annually.

The majority of issues encountered were due to the limited time and resources inherent in the trial[35]. There was an impact on end points with reduced data capture, in particular for the travel substitution calculations of four end points. These end points were excluded from the travel savings results. One end point had a hardware issue preventing correct capture of the date and time and associated call records. Overall, there were minimal software and hardware impacts, and once end points and reports were successfully setup, only minor monitoring and administration were required.

For future implementations of VM the following key issues[36] will need to be addressed:

- Ensure the Account Code function can be used to capture travel substitution numbers when initiating a video conference

- Resolve the bridge registration issue

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[32] From air and taxi costs only, excludes costs lost during employee travel time and any operational costs incurred.
[33] Calculation based on 89 HD VC end points identified in the June 2009 VC audit.
[34] Calculation based on annualised travel savings (air and taxi costs only) per unit of $31,181 totalled for the 89 HD VC units.
[35] Refer to Appendix 5: End Point Accuracy and Variance for details of each end point.
[36] A full list of issues identified in the trial can be found in Appendix 4: Issues, Impacts and Mitigation Complete List.

7. Recommendations

The results and experiences from this trial have led to a number of recommendations. The recommendations have not been listed in any particular order and there are dependencies between the recommendations. Ultimately, the priority for Telstra is to leverage the quantification of VC benefits to demonstrate industry leadership and create a competitive advantage in the VC market.

1. Implement VM (or comparable solution) internally across Telstra[37].
   <u>Recommendation owner</u>: Workforce Productivity.

2. Undertake additional calculation of the operational costs and CO_2e emissions generated by the different models of VC end points[38] to calculate the broader operational impacts of the video conferencing.
   <u>Recommendation owner</u>: TEG & CEG.

3. Engage with customers to pilot the VC quantification externally.
   <u>Recommendation owner</u>: TEG.

4. Undertake additional research and analysis to understand and maximise VC end point utilisation (for more details see Appendix 7: Utilisation Impact and Context Considerations).
   <u>Recommendation owner</u>: Workforce Productivity.

5. Investigate alternative tools to VM. This should not be undertaken at the cost of a delayed solution implementation.
   <u>Recommendation owner</u>: TPM.

6. Incorporate VM (or comparable solution) quantification capabilities into the VC product offering / roadmap. Consider the opportunity for quantification of related Telstra products and services.
   <u>Recommendation owner</u>: TPM.

7. Discuss partnering options for VM with the supplier to define and prioritise additional functionality and further strengthen the product offering to Telstra and its VC customers.
   <u>Recommendation owner</u>: TPM.

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[37] Include mitigation of issues identified during the trial, discussed in 5.4 Issues, Impacts & Mitigation.
[38] With particular regard to the high energy use units such as the Polycom RPX.

8. Appendices

8.1. Appendix 1: Glossary

Acronym	Explanation
Video Miles (VM)	A software tool that collects video conference data for multiple end points in order to calculate utilisation and travel savings
The Visual Environment	The developer and supplier of the VM software tool
End Point	The video conference hardware that manages and records each video conference
CDR	Call Data Record – a log of all call details for an individual video conference end point
CO_2e	Carbon dioxide equivalent
CEG	Telstra Corporate Environment Group
SLA	Service level agreement
AMX Controller	A third party device used to provide enhanced functionality and incorporates the control of the video conference unit
EDN	Enterprise Data Network
EBC	Experience Briefing Centre
TEG	Telstra Enterprise and Government
TPM	Telstra Product Management
TNS	Telstra Network and Services

8.2. Appendix 2: Video Miles Cost Break Down

Software License					
Quantity	Description	Unit Price (	Contract Length	Amount (GPB)	Amount (AUD)
11	Video-miles Videoconferencing Licenses for Polycome Endpoints	21	3	693	$1,405.71
2	Video-miles Videoconferencing Licenses for Polycome Endpoints TPX/RPX	45	3	270	$547.68
1	MCU	50	3	150	$304.27
1	Video-miles Setup and Upload to Server	800	3	800	$1,622.75
1	Video-miles report Application	500	3	500	$1,014.22
1	Video Miles Support	241.3		241.3	$489.46
Sub Total				$2,654.30	$5,384.09
NE Support (1 day per week for 3 months)		2560	3		$7,680.00
Total					**$13,064.09**

8.3. Appendix 3: Technical Implementation

The VM Fetchit software was installed on an available networked desktop computer by the Enterprise Voice team, only requiring additional access from the Enterprise Data Network (EDN) to the EBC network to include EBC video conference end points in the trial.

The Fetchit installation requires running the "Fetchit.msi" file and following a few simple steps. Once Fetchit is installed the only configuration required in the

application are the Video_Miles server details, a Video Miles user name and password, Telstra Proxy Server details and Telstra LAN user name and password for firewall authentication.

All endpoints participating in the trial were setup using the Fetchit application. All endpoints were setup in Fetchit exactly as they were configured on the Video-Miles server i.e. name, manufacturer and model. In addition to this, the user name and password as set on the endpoint also had to be entered to access the administration pages required to obtain Call Data Records (CDRs) data. Collection of hourly CDR was done by a scheduled job created on the server hosting the Fetchit application.

The application was installed on a Windows 2003 server running Intel Pentium 4 CPU 2.80GHz with 512MB of RAM.

The recommended reporting tool for VM, SiSense Prism, was used in the trial and enabled the creation of graphical representation of the data along with call details. The call records were exported manually for the trial.

8.4.   Appendix 4: Issues, Impacts and Mitigation Complete List

Table 1 Trial Issues & Impacts

Issue	Impact	Resolved	Proposed Mitigation
AMX controllers not supporting 'Account Code' capture.	Prevented meeting attendees entering the number of substitute travellers at the time of dialling into their video conference. Manual forms were used to capture this substitution data with high quality results for units with administrators and poor response for all other units.	No	Addition of the Account Code feature to each AMX controller used with a licensed VM end point. Testing to ensure no other unwanted impacts or issues. Note: this may mean purchasing an AMX controller for Cisco Telepresence & Polycom RPX units.
RMX bridges could not be successfully registered for multi-point call or use of a bridge for a point-to-point call.	All conferences using these bridges were not able to log travel savings as the end point location for the call could not be determined	No	It is mandatory this issue is proven to be resolved prior to any future implementation, so joint work to ensure successful registration and logging to be conducted with The Visual Environment (suppliers of VM).
Travel savings were not recorded for inbound conference calls from end points outside the trial (i.e. not licensed).	The data reflected less travel savings than may actually have occurred, therefore reflecting conservative results. However, these calls were included in the utilisation and call list data. Note: This was particularly high due to the limited number of licensed end points in the trial	No	Review the end points that would be licensed with VM and to assess the potential number therefore impact of inbound conference calls from non-licensed end points. Discuss this issue with the product supplier for any alternatives.
Technical end point fault i.e. not able to remember date/time when turned off.	The data could not be captured accurately and due to the age of the equipment there was no hardware	No	Ensure there are no technical issues with equipment licensed for VM and consider the age of the unit and associated hardware

Issue	Impact	Resolved	Proposed Mitigation
	support arrangement to have it fixed.		support arrangement.
Incorrect date/time on VC end points presented no data appearing on the portal - was actually logging under the default date of 1970.	Unable to include calls in trial data until resolved.	Yes	Date/ time set correctly on each end point with check to ensure it remains in memory when turned off.
Some geographical locations for video conference end points not licensed with VM were unknown as the name / identifier given to the end point did not provide sufficient information to identify this.	Travel savings could not be calculated for these conferences unless the end point location is known. Note: This was particularly high due to the limited number of licensed end points in the trial	Partially	Allocation of an appropriate resource to identify this where required either through technical channels or by following up with the meeting attendee. Note: each unknown end point only needs its location identified once.
A firewall password change halted call data uploads and end point call records were wiped before it was identified and resolved.	End point call records for the time period between the password change and when the call record was deleted were lost and could not be uploaded to the portal.	Yes (manually)	Appropriate support processes to ensure uninterrupted data capture and upload. Procedures in place for end point call record deletion to ensure call data upload prior to removal.
Processing time for firewall holes (required per end point) between EDN and EBC networks.	A delay in logging the data for these units until this was completed.	Yes	Sufficient planning to provide accesses between networks for required call record data uploads.
Delayed response from The Visual Environment, UK (suppliers of VM).	Resulted in a time lag for resolution of issues or completion of action e.g. end point registration, answering queries regarding onsite troubleshooting. This was not helped by the time difference and an inability to call the UK directly.	Yes	Formal support arrangement and service level agreements (SLA) in place for any future rollout. Involve Telstra's Use Conferencing and Collaboration Service Delivery group for support.

Issue	Impact	Resolved	Proposed Mitigation
Travel savings are allocated to the VC unit that initiated the conference (for point-to-point calls).	Has the potential for variances in VC unit level travel savings, although data was correctly reflected at the group level.	No	Education and communication; suggested processes to for appropriate data capture where possible.
Limited VM user / training documentation.	Documentation had to be produced in house	Yes	Comprehensive user documentation would be required for training in particular. This could be provided either by VM or as a component of a future implementation.

8.5. Appendix 5: End Point Accuracy and Variance

The list below shows each VC end point with additional information about the data accuracy of that end point based on impacts from the identified issues on data capture and quality. The indicator provides a level of confidence of the accuracy of the trial results for that unit (low, medium, high, very high). Any data identified as 'low' was excluded in the report results, as noted in the 'Notes and Assumptions' column.

Table 2 End Point Accuracy & Variance

Unit	Data Accuracy	Utilisation Indicator	Travel Indicator	Notes & Assumptions
TPM Electric Room	Delayed data capture by two weeks. Attendee substitution not successfully recorded.	Very High	Low	Excluded from reported travel savings. Utilisation is conservative and could be as much as 20 per cent higher.
TPM Viper Room	Delayed data capture by two weeks. Attendee substitution not successfully recorded.	Very High	Low	Excluded from reported travel savings. Utilisation is conservative and could be as much as 20 per cent higher.
TPM Cobalt Room	Attendee substitution not successfully recorded.	Very High	Low	Excluded from reported travel savings.
TPM Room 1	Attendee substitution not successfully recorded.	Very High	Low	Excluded from reported travel savings.
TEG Conf Room Old System	Substitution data captured at point of VC initiation.	Very High	Very High	
TEG Conf Room Media Centre	Substitution data captured at point of VC initiation.	Very High	Very High	

Unit	Data Accuracy	Utilisation Indicator	Travel Indicator	Notes & Assumptions
TEG Room 3	Substitution data captured at point of VC initiation.	Very High	Very High	
TEG Agnes Sheehan desktop	Substitution data captured at point of VC initiation.	Very High	Very High	
TNS Derwent Room	Approximately half the conferences conducted were audio-only calls, hence 50 per cent less utilisation than recorded. Some conferences used a bridge with two calls not capturing travel substitution.	Medium	High	
EBC RealPresence Room Melbourne	Manual processes were used to capture the travel substitution – but, as the room as an allocated administrator, they took responsibility for asking for this information at each meeting.	Very High	Very High	Unit used for both customer demonstrations and internal meetings which may impact the results but not the accuracy.
EBC RealPresence Room Sydney	Manual processes were used to capture the travel substitution – but, as the room as an allocated administrator, they took responsibility for asking for this information at each meeting.	Very High	Very High	Unit used for both customer demonstrations and internal meetings which may impact the results but not the accuracy.
EBC Fremantle Boardroom	Conferences using the bridge could not record travel savings. Maximum possible number is 13.	Very High	High	Conservative travel savings.
EBC Meeting Room 2	Hardware issue prevented accurate data capture of utilisation and the associated travel substitution.	Low	Low	Excluded from all results provided in the report.

In addition the following considerations contribute to the accuracy of all VC end point data:

- Attendee substitution numbers are subjective values chosen by meeting individuals
- The lower the number of total substitutions for a VC end point, the greater the impact of individual substitution numbers

8.6. Appendix 6: End Point Breakdown

The list below provides an indication of average unit recommended retail price (RRP)[39] and capacity of each type of VC end point included in the trial. Please note these are not the actual costs for the trial units but **only an indication** to provide a relative basis for comparison of the results. The indicative costs are for the hardware only and capacity is also dependent on room size and layout.

Table 3 Indicative End Point comparisons

Type	Average RRP[39] (hardware only)	Capacity (recommended)	Notes[40]
Polycom HDX 8004	$30,250	4 – 8 people	High definition, medium bandwidth supporting up to 4 MB
Polycom HDX 8002	$19,750	4 – 8 people	High definition, medium bandwidth supporting up to 2 MB
Polycom HDX 9004	$32,500	8 – 12 people	High definition, used for fully integrated environment even where full capacity not required
Polycom VSX 7000E	$19,750	4 – 8 people	Standard definition
Polycom HDX 8004 XL	$52,600	6 – 8 people	Media Centre, point to point only, includes 2 screens
Polycom HDX4002 XL	$17,100	1 – 2 people	Desktop unit
Polycom RPX	$447,350	8 seats	Life size representation. Hardware costs vary greatly based on capacity i.e. $395,000 to $855,000

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[39] Includes 52″ screen cost of $3,000 where screen not included in unit price & .76 cent USD to AUD exchange rate
[40] Each VC end point type has various additional specifications

8.7. Appendix 7: Utilisation Impact and Context Considerations

While the VM software provides individual end point call details and enables consolidated utilisation figures, in order to maximise utilisation further research to understand the impacts on employees' use of video conferencing would be valuable. Due to the small sample size of VC units included in the trial, comparison between units to provide any insights into the contributors to the utilisation of individual units would not be considered a fair representation. Throughout the process of organising, conducting and reporting on this trial various reasons or potential impacts on utilisation have been identified and are listed below for consideration for further analysis:

- Business unit owner
- End point booking system i.e. ease of booking
- End point equipment i.e. age, reliability
- Capacity (for a quality VC experience not just the number of people who can physically fit into a room)
- Accessibility i.e. secure floor
- Dedicated room administrator
- Geographical location
- Attendee type i.e. employees, demonstration customers, paying customers
- Predisposition to VC type i.e. desktop or room based

In addition, a wider context for further analysis and research could include:
- Room to staff ratios
- Room size to staff ratios
- Staff role to VC end point usage
- Average meeting size
- Comparison with other collaboration solutions e.g. web conferencing