



Management Group

DATE: December 8, 2009

TO: TransLink[®] Management Group

FROM: Janet Gallegos, Booz Allen Hamilton (Program Manager for Consortium Assistance Contract)

SUBJECT: Consortium Information Management System (CIMS)

At the last TMG Meeting of November 23, 2009, a request was made for additional information regarding CIMS. The information requested was as follows:

- ***TDS Store and Auditing Functions***: Further explanation of the TDS Store, its relationship to CIMS and its functions as an alternative to CIMS
- ***TransLink[®] Contractor Responsibilities***: Contract requirements and implications
- ***Operating Costs***: A validation of the \$300,000 estimate for the annual operating cost

TDS Store and Auditing Functions

The TDS Store has its origin from a TransLink[®] contract requirement that the Contractor provide the Operators with direct access to the raw data generated at the TransLink[®] devices (such as CIDs, AVMs, TOTs). However, it was found the direct capture of data from the devices was impractical, and there was no contract provision for developing a process for interpreting this data; therefore, the raw data was of no value to transit agencies wishing to use it to audit the system. As a result, an alternative solution was designed that would capture the raw data from the TransLink[®] Data Servers (i.e., TDS or site computer) and provide the data in XML format so that it could be used by each agency for auditing and other purposes. This solution became what is now called the TDS Store.

The Report Server and the Data Store are the other TransLink[®] systems that provide Operators access to their transaction data. In both of these systems, the data provided has come from the TDS, and has subsequently been processed by the TransLink system. Along with the raw data from the TDS Store, the processed data from these two sources can be used for reconciliation and audit purposes.

During the early stages of CIMS development, the plan was to pull the “source data” from the TDS Store since it is the closest to the source of the raw data (i.e., the devices); therefore, agencies, wishing to use CIMS, must have a TDS Store. To date, SFMTA and Caltrain are the only agencies that have requested a TDS Store, and SFMTA has opted out of using CIMS. Those agencies who are without a TDS Store and who have opted out of CIMS have elected to

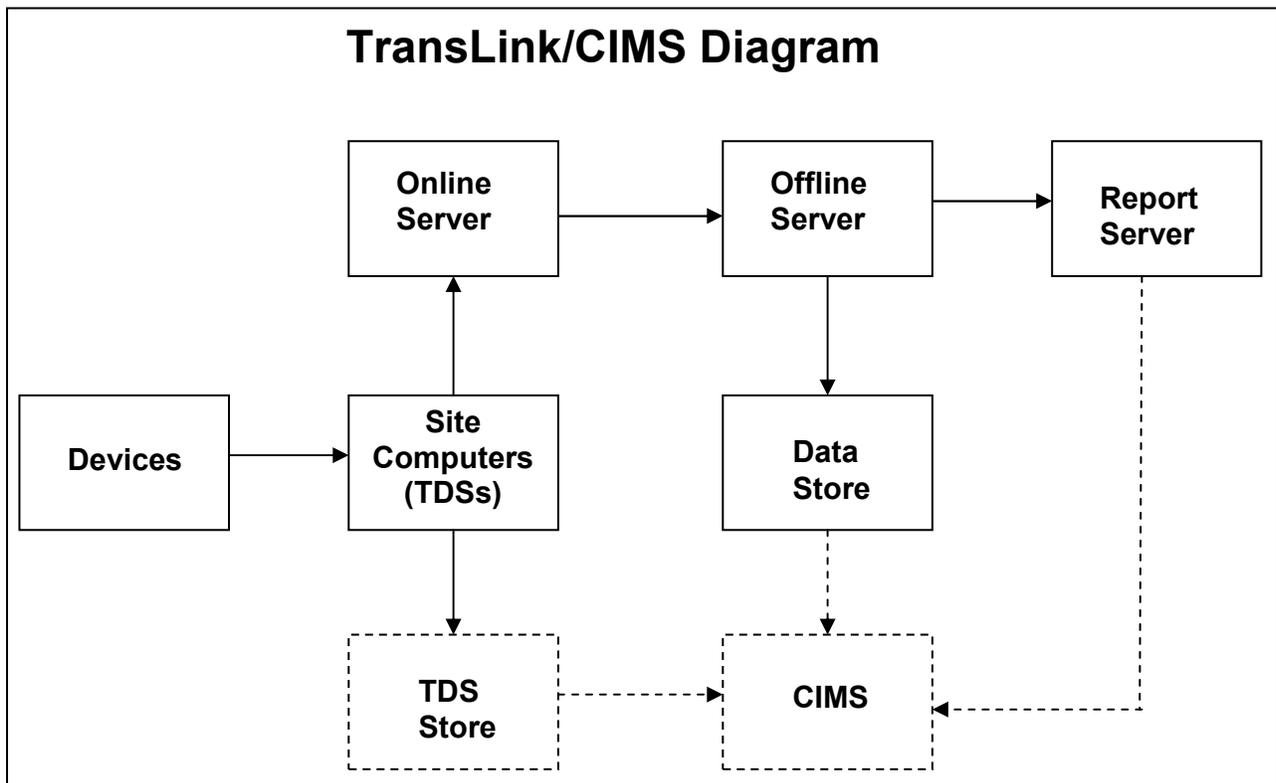
use other methods for reconciliation, and to rely on the annual independent audits coordinated by MTC. Table 1 summarizes the results of a recent poll taken to determine which tools each agency intends to use.

TABLE 1: Audit Process by Agency

	AC Transit	BART	Caltrain	Golden Gate	SFMTA	VTA
TransLink® Reports Server	✓	✓	✓	✓	✓	✓
Data Store		✓	✓	✓	✓	✓
TDS Store			✓		✓	✓
BART DAS		✓				
CIMS			✓			✓

CIMS takes the raw data from the TDS Store and compares it to the processed data from the Data Store and the Report Server to verify that a particular transit agency has received the appropriate settlement funds. Operators have equal access to the systems used by CIMS, and the same audit may be conducted without CIMS. Regardless of the method used, there will almost always be some discrepancies between the unprocessed and processed data (due to issues such as duplicate transactions and gaps processing for example), and these differences must be taken into consideration when comparing data streams.

The following diagram conveys where the TDS Store fits into the overall TransLink® architecture and how CIMS and the Agencies will perform auditing functions.



Audit Process Summary: Data from the TDS Store is in a format that enables agencies to perform audits comparing the unprocessed data against the processed data available at the Data Store and Report Server. The same is true for CIMS. CIMS will take the unprocessed data from the TDS Store and compare against the processed data.

Table 2 summarizes the data output and sets available through each system:

TABLE 2: Data Output and Description by System

System	Data Output	Data Description
TDS Store	Unprocessed Electronic (XML)	<ul style="list-style-type: none"> • Raw (unprocessed) data captured from each Operator’s site computers • Contains every piece of data generated by an Operator’s devices (e.g., financial transactions, alarms, events, audit registers)
Data Store	Processed Electronic (XML)	<ul style="list-style-type: none"> • Processed data captured from Cubic’s central database • Contains a subset of all Operator data processed by the system (i.e., financial transactions only)
Reports Server	Processed Formatted (Excel/PDF)	<ul style="list-style-type: none"> • Formatted reports generated using (processed) data from Cubic’s central database • Includes financial, sales, ridership, maintenance, and other operations-related reports
CIMS	Formatted (PDF)	<ul style="list-style-type: none"> • Formatted exception reports generated by comparing unprocessed data from the TDS Store against processed data from the Data Store and Reports Server

Contractor Responsibilities

The development and deployment of the TDS Store was included in a change order to the TransLink[®] Contract. The contractor has completed the development, testing and is now ready for deployment in the field. Final site-preparation is needed at SFMTA prior to installation and the details for site-preparation and installation at Caltrain are being finalized. As soon as a TDS Store is installed, the Contractor will support testing to confirm its performance as specified in the contract.

Resolution of discrepancies identified through CIMS will require a change order to the TransLink[®] Contractor because CIMS is not a Contractor supported system; whereas, resolution of discrepancies identified by agencies utilizing the Contractor supplied systems to perform audit functions is within the Contractor’s scope-of-work.

Operating Cost Validation

In August 2006, TMG approved a cost allocation model which specified that 50% of the annualized costs would be shared equally among six transit operators. The remainder of the

operating costs would be absorbed by the agencies using CIMS. At the time the Finance committee recommended that the operating costs not exceed \$300,000. Table 3 provides the estimated cost allocation assuming two agencies (VTA and Caltrain) are using CIMS.

TABLE 3: TMG Year 1 Allocation (Based on Finance Committee Estimates of ~\$300K, August 2006)

Operator	AC	BART	Caltrain	GGT	SFMTA	VTA	TOTAL
50% fixed	\$24,583	\$24,583	\$24,583	\$24,583	\$24,583	\$24,583	\$147,498
50% Usage	\$0	\$0	\$73,750	\$0	\$0	\$73,750	\$147,500
Total	\$24,583	\$24,583	\$98,333	\$24,583	\$24,583	\$98,333	\$294,996

Although the operating costs for CIMS were never finalized with CMC Americas, the CIMS contractor did submit another estimate of costs in August 2007. CMC proposed a 3 year contract, which *did not include* software licenses, upgrades or maintenance fees. This latest information is reflected in Table 4 and is derived from the CMC submission.

TABLE 4 - CMC Expense Estimates August 2007

Hosting Charges (3 Year Contract)	Year 1	Year 2	Year 3	Total
Initial one-time hosting charge	\$150,000	0	0	\$150,000
Annual Operating	\$336,000	\$379,200	\$408,00	\$1,123,200
Software licenses ¹	Extra	Extra	Extra	
Software upgrades/maintenance ²	Extra	Extra	Extra	
Research ³	Extra	Extra	Extra	
Total all charges	\$486,000	\$379,200	\$408,000	\$1,273,200 + extras

An allocation of these expenses, based on the TMG approved model, and assuming two agencies (VTA and Caltrain) use CIMS is shown in Table 5.

¹ Cost of purchasing software licenses. This expense is identified by CMC as follows: “Software licenses will be charged as and when purchased for the project.”

² Cost of implementing upgrades and patches. This cost is referenced by CMC as follows: “[based] on actuals and need if required by VTA”

³ The cost of investigation and resolution of discrepancies by the TransLink[®] contractor (now Cubic) was not estimated.

TABLE 5 - CMC Expenses Year 1 Only

Operator	AC	BART	Caltrain	GGT	SFMTA	VTA	TOTAL
50% fixed	\$40,500	\$40,500	\$40,500	\$40,500	\$40,500	\$40,500	\$243,000 +extras
50% Usage	\$0	\$0	\$121,500	\$0	\$0	\$121,500	\$243,000 + extras
Total	\$40,500	\$40,500	\$162,000	\$40,500	\$40,500	\$162,000	\$486,000 + extras

If the CMC costs are accurate, *and* a 3-year hosting agreement was also approved, the cost allocation for the three year period is reflected in Table 6.

TABLE 6 - CMC Expenses Years 1-3

Operator	AC	BART	Caltrain	GGT	SFMTA	VTA	TOTAL
50% fixed	\$106,100	\$106,100	\$106,100	\$106,100	\$106,100	\$106,100	\$636,600 +extras
50% Usage	\$0	\$0	\$318,300	\$0	\$0	\$318,300	\$636,600 + extras
Total	\$106,100	\$106,100	\$424,400	\$106,100	\$106,100	\$424,400	\$1,273,200+ extras

Peer Agencies

Should the TMG choose to implement and operate CIMS; it will be the only such audit tool in operation. A recent poll of five other agencies indicates that they rely on system supplied information and reports to conduct end-to-end transaction integrity checking.

SUMMARY

- CIMS, *as defined*, is a *robust* audit and reconciliation appliance, which captures and compares information from contractor supplied data streams for the purposes of identifying errors or discrepancies in the transaction totals.
- Two agencies, out of six, have opted to utilize CIMS for auditing purpose and both are in the process of have a TDS Store installed. Agencies must have a TDS Store to use CIMS.
- The reconciliation process for CIMS may be complex, since some transactions are routinely determined by the Cubic system to be *not good for settlement, or allocated to GAPS processing*, and these will not be captured by CIMS. Discrepancies will require follow-up and research by the Contractor, and Cubic has not agreed to participate without compensation in this exercise.
- Operating costs have not yet been finalized, but may be greater than the \$300K originally estimated.
- There are other available and viable methods of reconciling transactions and auditing data, including direct access to the TransLink[®] data utilized by CIMS, and MTC-conducted audits of the system.
- Other US agencies with major smart card programs do not have a tool such as CIMS in place.