San Francisco’s Multiagency ClipperSM Card Advances

The ongoing rollout of the Metropolitan Transportation Commission’s (MTC) multiagency ClipperSM fare card in the San Francisco area has eliminated many existing fare instruments. By the end of 2010, the Alameda-Contra Costa Transit District (AC Transit), the bus system that connects Alameda County, Contra Costa County, and San Francisco, dropped its use of paper adult local 31-day and ten-ride tickets. Earlier, the Bay Area Rapid Transit (BART) had stopped using its EZ Rider cards for fares and parking. As of 31 January 2011, Caltrain, the commuter rail system from Gilroy through San Jose and Silicon Valley to San Francisco, eliminated its eight-ride paper tickets and its monthly paper tickets. All these functions have been taken over by the ClipperSM card. In the beginning of February 2011, the San Mateo County Transportation Agency (SamTrans) started accepting the new card with the intent of eliminating all its paper fare instruments by the end of 2011. The Santa Clara Valley Transportation Authority (VTA) started accepting the card in mid-February 2011, simplifying transfers between SamTrans and VTA as the same card could handle not only the main fare but also the transfers.

On Caltrain, users of the monthly passes will have the pass available for

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The monthly user needs to tag on and off the first time the monthly pass is used. For the system to recognize the validity of the ClipperSM card, there must be at least US$1.25 in cash value on the card. When the passenger tags on, the card registers a fare to the furthest station. When the passenger tags off, the card is loaded with the monthly information, and the US$1.25 in cash is returned to the card. If the passenger tags off beyond the distance covered by the monthly pass, then the system will deduct the cost of a zone upgrade to where the passenger tagged off. After the first usage per month, the passenger no longer needs to tag on or off as the monthly information has been uploaded to the card and will register on the hand-held checking devices carried by fare inspectors. If the passenger wants to travel beyond the zone of the monthly pass, then he/she needs to tag on and off so that the system can deduct the proper zone upgrade fare. Monthly card users can also buy parking permits using the card.

The MTC was created by the California state legislature in 1970 to act as the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. In 2002, the MTC debuted a multi-agency fare instrument called TransLink. The intent of TransLink was to have a single stored value fare instrument that was accepted by all the methods of transportation in the San Francisco Bay Area.

In June 2010, the MTC decided to rename TransLink as ClipperSM in honor of the Clipper ships that were used to bring goods and supplies to and from the San Francisco Bay Area of California and to avoid confusion with the Greater Vancouver transportation agency in Vancouver, British Columbia.

ClipperSM can now be used on the San Francisco buses and trolleys (Muni), BART, AC Transit, SamTrans, Caltrain (Figures 1–4), and the Golden Gate Transit bus and ferry routes (Figure 5). The intent is to expand the use of the cards to all types of fare instruments on all the agencies providing public transportation in the San Francisco Bay Area.

Vancouver to Get a New Fare System

TransLink, the Greater Vancouver transit authority, has awarded Cubic Transportation Systems, a business unit of Cubic Corporation, a contract valued at US$220 million to deliver and operate a new smart card fare payment and revenue management system for the region’s rail, bus, ferry, and paratransit services.

The base contract for US$84 million includes the design, supply, and installation of the system, which will include new fare gates, to be delivered by 2013.

Currently, TransLink operates a proof-of-payment system, which relies on roving fare inspectors to conduct random checks on customers to produce a ticket or receipt. The new system will use fare gates (called turnstiles in the past), requiring all customers to present their contactless smart or bank card to an automatic reader to enter the paid areas of the transit stations before boarding the trains. TransLink decided to add the fare gates, to reduce fare evasion and increase customer security.

Following delivery of the new system, a ten-year services contract valued at approximately US$13 million per year, in addition to a one-time US$6 million transition cost, will begin. The contract includes an option for five additional years of services.
A major addition to the new system will be the smart card and open payment capability to accept bank cards and other media that meet contactless technology standards.

The contract is the third largest initial award in Cubic Transportation Systems’ history, preceded by London and Sydney. It is Cubic’s fourth contract for complete design–build–operate–maintain services, with previous contracts including London, Brisbane, and Sydney.

The contract also continues Cubic’s nearly 15 years of service to Vancouver’s regional transit systems. Including contract awards in 1997 and 2001, Cubic designed and delivered a magnetic-based system linking Coast Mountain bus, SeaBus ferry, and SkyTrain. In 2009, Cubic delivered the fare collection system for the Canada line.

**PATCO to Test Credit and Debit Cards in Fare Gates**

The Port Authority Transit Corporation (PATCO), a subsidiary of the Delaware River Port Authority, has signed a pilot agreement with Cubic Transportation Systems, the transportation segment of Cubic Corporation, to install a system to allow their passengers to pay transit fares with their credit or debit cards.

The PATCO commuter line connects to two other major transit systems that serve the northeast corridor, New Jersey Transit and the South-eastern Pennsylvania Transportation Authority. Cubic’s new open-payment technology will be integrated across PATCO’s 14-mi line between Lindenwold, New Jersey, and Philadelphia and will simplify how customers pay their fares by eliminating the need to carry a separate transit payment card.

Today, more than 70% of PATCO customers use the FREEDOM card, the smart card used in the PATCO ticketing and revenue management system developed by Cubic. The pilot will operate in parallel with the current system, and the FREEDOM card payment will not be affected by the pilot.

For the first half of the year-long pilot, Cubic’s banking partner will issue a branded reloadable pre-paid card with a contactless interface that can be used for PATCO rides in addition to retail purchases where branded prepaid cards are accepted.

During the second half of the pilot, any bank card with a contactless chip will be accepted on the PATCO system. Senior citizens will continue to use their FREEDOM cards to obtain their discounts. There are no plans to eliminate the FREEDOM card in the near future. The only intention is to provide an additional method of payment for fares.

**High-Speed Train Service Between Russia and Finland**

With the December 2010 timetable change, Russia and Finland inaugurated a new high-speed train service between the two countries (Figure 6). With a commercial speed of 137 mi/h in Finland and 124 mi/h in Russia, the four Allegro trains ordered by Oy Karelian Trains, a company owned 50% by VR-Group of Finland and OAO RZD of Russia, in 2007 now link Helsinki to St. Petersburg in three and a half hours compared to five and a half hours previously. The start of the high-speed services required extensive track work in Finland and Russia. Station service level was improved in Kouvola and Vainikkala in Finland and Vyborg and St. Petersburg in Russia.

The Allegro stops after Helsinki at Pasila, Tikkurila, Lahti, Kovuola, and Vainikkala in Finland and Vyborg in Russia at the existing stop of Vyborg in Russia before reaching St. Petersburg.

The initial service is two round trips per day, but by mid-2011, the intent is to provide four round trips a day between the two cities. The high-speed trains are based on the Pendolino platform, which has been in service in Finland since 1995. They are specifically designed to meet the extreme winter conditions in both countries (temperatures can drop to as low as −40°C). The trucks (bogies) are equipped with devices designed to reduce the accumulation of snow and ice. Specific heating and air-conditioning systems have also been installed.

The Helsinki–St. Petersburg Pendolino is a high-speed nonarticulated multiple unit train with distributed traction. Pendolino trains are equipped with an active system that tilts the
train on curves. The maximum tilt of 8° enables speeds 20–30% higher on curves as compared to nontilting trains, while providing maximum passenger comfort. They require no modifications to the existing tracks.

These trains are produced at Alstom’s Savigliano site in Italy, their traction systems are manufactured at Sesto San Giovanni, near Milan (Italy), and the bogies are made at Le Creusot (France).

**Tri-Met Awarded Federal Grant for Energy-Saving Devices**

Tri-Met, the Tri-County Metropolitan Transportation District of Oregon, received a US$4.2 million grant in December 2010 from the Federal Transit Administration (FTA) to expand the use of regenerative braking on its metropolitan area express (MAX) light rail trains. The grant will allow Tri-Met to install 20 energy storage units on light rail vehicles, capturing much of the energy generated by the trains’ braking systems and storing that energy for immediate and future use.

While Tri-Met has employed regenerative braking on MAX since 1997 with the introduction of low-floor trains, it only saves energy when there is an accelerating train in the vicinity of the braking train. This method uses 70% of the energy produced.

The new units will allow the braking energy to be stored to help power other trains on the system as well as trains in the vicinity of the braking train. The storage units, in this case energy capacitors, will be designed to capture and use nearly 100% of the power generated by braking trains, providing an anticipated saving of US$168,000 a year in energy costs.

“We’re excited to be on the cutting edge of energy-saving technology and serving as a model for other transit agencies across the country,” said Tri-Met’s general manager Neil McFarlane. “The use of these storage units for rail transit systems is relatively new, and no other transit agency in the U.S. is doing what we are with these systems.”

Tri-Met’s current regenerative braking systems save 12 million kWh of the overall energy needed to operate the light rail system every year. With the new storage units, it is anticipated that 70,000 kWh would be saved annually for each equipped train. Twenty light rail vehicles would thus annually save 1.4 million kWh. Tri-Met will begin installing the units on trains in 2011.

Tri-Met was selected by the FTA to receive the funds from the Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER) grant program. The program funds cutting-edge projects that create green jobs, encourages the use of clean fuels, and helps reduce energy consumption and greenhouse gases and other pollutants. Tri-Met was one of 27 recipients for TIGGER funds out of a total of 173 applications from across the United States.

**New Electric Locomotives to Turkey**

Hyundai Rotem Company, an affiliate heavy industry company of the Hyundai Motor Group, has announced that it has won a contract to supply electrical locomotives to the Turkish State Railways Administration (TCDD) worth US$400 million.

Hyundai Rotem has exported diesel electric locomotives since 1979, but this is the first time Hyundai Rotem will export electric locomotives. The vice chairman and CEO Yeo Sung Lee visited Ukraine on 16 December 2010 to sign a contract for high-speed electrical multiple units (EMUs) for Ukraine and then continued on to Turkey to sign a contract for the electric locomotives with TCDD.

Hyundai Rotem has supplied approximately 800 units of rolling stock for seven projects including Light Rail Vehicles and Diesel Multiple Units in Turkey since 2010, starting with EMUs for Istanbul. In the United States, Hyundai Rotem is in the process of delivering Silverliner V EMUs to the Southeastern Pennsylvania Transportation Authority from an assembly plant they built in South Philadelphia.

The electric locomotive that Hyundai Rotem will export to Turkey is similar to the Istanbul EMUs in terms of its driving system but will provide more than 5,000 kW of traction output.

At the contract signing ceremony, Yeo Sung Lee said, “the electric locomotive not only minimizes pollution and maximum environmental friendliness, but compared to its diesel counterpart, is more economical, emits fewer greenhouse gases, and, importantly, makes less noise.” He continued, “We appreciate trust and continuous orders of TCDD and will provide high-quality vehicles and full compliance with delivery as we have been doing for TCDD in return.”

**New Rapid Transit to Mecca**

The Al Mashaaer Al Mugaddassah Metro project, an 11-mi rapid transit line from Mina to Arafat, entered service in December 2010. Mina lies about three miles from the holy mosque in Mecca. The line serves nine stations and runs alongside the route of the pilgrims to the Plain of Arafat (Figure 7).

Designed to transport 72,000 passengers per hour per direction at a speed up to 50 mi/h, it helps pilgrims to quickly and comfortably travel between the holy sites in and around Mecca.

The Mobility Division of Siemens supplied and installed the complete railway electrification, including the traction power substations with 110kV high-voltage systems, extensive 13.8
and 1.5 kV equipment and cabling, and the overhead catenary lines. The line is fed with 1.5-kV dc from 11 substations.

**New Trains to Berne**

Regionalverkehr Bern-Solothurn (RBS) is buying another eight NExT low-floored multiple-unit express trains. The first six of these modern vehicles from Stadler have been successfully operating between Solothurn and Berne since 2009. On 24 January 2011, Stadler Rail announced that the RBS had exercised its option to buy an additional eight NExT trains, with an order value of about CHF 64 million (Figure 8).

The RBS is part of Berne’s commuter railway system. It operates four railway lines, S7, S8, S9, and RE, and ten bus routes within the integrated transport system (Figure 9). It has a total of about 23 million passengers per year and is one of the most used private railways in Switzerland.

Thanks to the six NExT trains, in operation since 2009, the RBS has been able to add additional capacity to the timetable between Solothurn and Berne at peak hours in the mornings and evenings. It needs more multiple-unit trains to continue to meet the constantly growing demand in the Berne-Solothurn corridor in the years ahead. With the eight additional NExT trains, only modern trains traveling at 75 mi/h will be in operation between the canton capitals.

The RBS will completely modernize the vehicles currently operating alongside the NExT trains between Solothurn and Berne (which are nearly 20 years old) and use them on the S8 line starting in 2014. There they will replace RBS’s oldest commuter trains from the 1970s. This shuffling of resources will enable longer trains with about 20% higher capacity to operate on the S8 line in the future, and the timetable can be extended.

Hans Amacker, the director of RBS, stated, “Our first six NExT trains are very popular and have proved themselves in daily operation. These modern, very carefully designed trains have a seductively elegant, functional design, offering the passenger the greatest possible space. I am delighted that we will be able to offer our passengers even more comfort with the new NExT.”

Tailor-made for the RBS, the NExT trains are air conditioned and equipped with video monitoring, emergency telephones, a fire alarm, and fire extinguishing equipment. Furthermore, it is possible to walk from one end of the train to the other, improving safety and helping the passengers distribute themselves more quickly throughout the train. The vehicles feature comfortable seating with generous legroom, good visibility, and very large windows. There are seats for 154 passengers, 18 of which are in first class, and a standing room for 289 people. The eight new NExT trains are scheduled to be delivered in 2013.

**ERTMS for New South Wales**

The Australian commuter rail operator in New South Wales, RailCorp, has awarded several contracts worth €48 million for its new rail signaling system to Alstom. The Australian railroads are investigating several different systems to improve safety and enhance capacity of their rail networks. RailCorp has chosen the European Rail Traffic Management System (ERTMS) for Sydney’s CityRail network.

The first 50 newly equipped trains will begin service in 2013. One-third of CityRail’s network will be installed with ERTMS level 1 technology by...
2015. ERTMS level 1 is specifically designed to improve safety across the network by providing predictive enforcement of positive stop signals (Figure 10). In total, 160 trains will be fitted with the equipment, covering more than 370 miles of track.

A nine-year maintenance contract is part of the agreement. The agreement also includes a pilot line for ERTMS level 2, which will be installed on the Cronulla Branch Line (Figure 11). “ERTMS level 2 would give Australia the potential to upgrade to high-speed rail,” said Chris Raine, the president of Alstom in Australia. “Installation of level 2 will permit more trains per hour, with improved safety and reliability.”

The ERTMS installation will provide an additional layer of security...
for Sydney’s rail network by using radio transceivers placed at regular intervals along the track, which communicate directly with compatible trains. Together with the transponders located between the rails CityRail will have a predictive enforcement of their wayside signals rather than the existing reactive enforcement, allowing trains to operate closer together with improved safety.

Delivery of the new EMUs is scheduled to begin in 2012 and be completed in 2014. They will be mainly used for express train lines that run through mountains and on the east coast of Taiwan on the TRA’s narrow gauge (1,067 mm) lines.

The trains will have a streamlined aluminum body and will be used in an arrangement of 17 eight-car trains. The interior is designed with a barrier-free concept, which provides an easy ride for passengers with small children and they meet the latest international safety standard for fire resistance.

The cost of the contract, about NT$11 billion, will come from the NT$1,432.3 billion plan for upgrading Taiwan’s infrastructure from 2009 through 2016.

Correction

In this column in the March 2011 issue, a decimal point was inadvertently moved. The correct total value for the Bombardier/AnsaldoBreda contract for high-speed trains for Italy should have been €15.4 million. In that same column, it was stated that Sao Paulo is a suburb of Lapa. Of course, it is the other way around. Lapa is a suburb of the much larger city of Sao Paulo.

We apologize for these errors and regret any confusion they may have caused.

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