

**Creating a Long-Term Transit Culture Among Students
Ensuring Secured Fare Media in a Successful U-Pass System**



A White Paper

By

PICS SmartCard Inc.

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Abstract: Ridership on public transit in North America is rapidly expanding, necessitating the need for secure fare media systems to be in place to ensure the success and implementation of planned and future growth. The primary partners in the Vancity U-Pass project, Greater Vancouver Transportation Authority (Translink), the University of British Columbia (UBC), Simon Fraser University (SFU), and their respective student associations, implemented the U-Pass program in September of 2003 with resounding success. To ensure the success of the U-pass program, Translink maintained a revenue neutral position and required a secure fare media system. Custom software was developed for Translink and licensed from PICS SmartCard – the PICS Solution; it guaranteed the viability of a secure fare media and was put into place to facilitate the success of the U-Pass program. The goals of reducing single occupancy vehicle trips and vehicle emissions, increasing transit usage, incubating a transit culture among students, and providing affordable transportation options to students have all been met or surpassed. Subsequently, the PICS Solution has been utilized by Translink to issue passes outside of the U-Pass program to employers, government, and the community with annual revenues in excess of \$35 million dollars.

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Background

The universal pass (U-Pass) system has been adopted across North America with an extremely successful program running at the University of Washington since 1991. After ten years, despite steady population growth, U of W related peak hour traffic remained below pre-U-Pass levels. Echoing this success, the Vancity U-Pass has been successful in decreasing university related traffic and increasing ridership. The launch of the U-Pass at UBC and SFU was one of the most successful in North America.ⁱ The Vancity U-Pass was first discussed in 1996, and after extensive negotiations between the partners, was launched in September 2003.

The goal of the primary stakeholders in the U-Pass project was to stimulate ridership with the introduction of the U-Pass period pass. With a fleet of 1,300 buses and an annual operating budget of \$572 million, it was necessary for Translink to ensure their fare media was secure for the continued success of this program. This situation represented a unique set of problems with regard to systems integration and security solutions ensuring continuous and immediate authentication of users of the U-Pass.

The Challenge

- Increased and affordable ridership on public transit is important to ensure growing an inclusive society.
- Public transportation solutions must promote affordable accessibility, environmental sustainability, and quality of life for citizens.
- With a population of over 2.1 million people, the Greater Vancouver Regional District accounts for more than 50% of the total population of the province of British Columbia.ⁱⁱ
- The over 60,000 students at the University of British Columbia and Simon Fraser University provide the demographic opportunity to encourage leadership in choice and change among transportation options. Consistently ranked among the top universities in Canada, UBC and SFU are poised to lead the way in creating an affordable and sustainable public transportation culture.
- Demographic choices of where to live, work, and study can be positively impacted by access to affordable, reliable, and convenient public transportation.
- Public transportation fare media must be reliable, efficient, and secure against loss or fraudulent use to ensure an economic advantage to both provider and pass users.

Implementing the U-Pass Program

The U-Pass program is an integrated transportation program that provides students with universal and affordable access to public transportation. A mandatory program for all

students attending SFU and UBC, the program has been in effect since September 2003 at both campuses and has been approved by student referendums in both 2003 and 2005.

The U-Pass provides all SFU and UBC students with unlimited access to Translink's Lower Mainland transit services including the bus, SeaBus, and SkyTrain services, as well as discounts on the Westcoast Express for a monthly fee that is part of their student society fees each semester and collected by the universities.

Translink's U-Pass system serves over 60,000 students each term at both UBC and SFU. Translink, UBC, SFU, and their student associations implemented the U-Pass program in September of 2003 with the following goals:

- Reduce single-occupancy vehicle trips to the universities
- Increase transit ridership
- Create a "transit culture" among post-secondary students
- Reduce vehicle emissions
- Provide students with more affordable transportation options
- Deter or avoid capital expenditures for transportation infrastructures (i.e. parking lots) at the universities

All of these goals were achieved.

Reducing SOV Trips to the Universities

One of Translink's primary objectives is to reduce the rate of growth of automobile traffic in the Greater Vancouver Regional District. A key policy direction in the Greater Vancouver Transportation Authority's (Translink) Vancouver/UBC Transit Planⁱⁱⁱ includes the hierarchy of walking, cycling and transit over single occupant vehicle travel. "The U-Pass system was designed to reduce single vehicle occupancy, vehicle trips to the universities, reduce the amount of car congestion on major arteries going to the universities, and try to encourage more transit ridership within our funding envelope," says Alan Houston, Program Manager, Revenue at Translink.

The universities also desire a reduction in single occupancy vehicle traffic – reducing single occupancy vehicle traffic and increasing the use of transit is one of the main objectives of the UBC Campus Transit Plan^{iv} and the UBC Official Community Plan approved by the GVRD in 1997. "The reduction of automobile traffic to and from the campus is integral to the development of a sustainable University Town," stated Dennis Pavlich, UBC Vice-President of External and Legal Affairs.^v

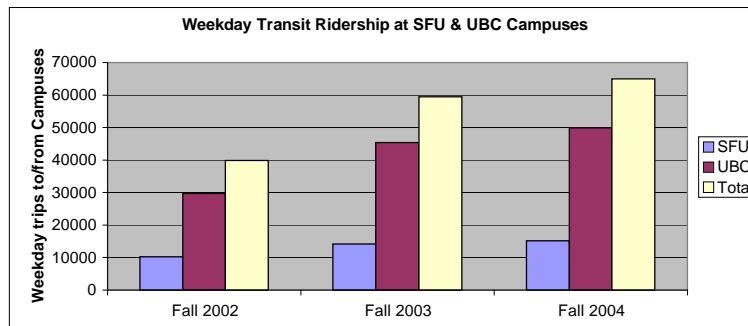
As of May 2005, single occupancy vehicle traffic at UBC has been reduced by 20 percent and the U-Pass decreased the reliance on vehicles at SFU by over 60 per cent. Overall traffic volumes at both universities continue to decline. According to a Statistics Canada report released on July 17, 2006, British Columbians traveled five billion fewer kilometres in their vehicles in 2005 compared to the previous year. The U-Pass program is named as contributing to this decline according to Translink spokesperson Ken Hardie.^{vi}

Increasing Transit Ridership

“We recognized that there was significant potential for ridership gain,” said Glen Leicester, Vice President of Planning at Translink. One of the main goals of the U-Pass program was to increase transit ridership. “What Translink wants to do is have the students realize that there are options out there, other than taking a car,” said Benson Chin, Marketing Specialist at Translink. Transit ridership at UBC increased 53 per cent in the first year and was up 39 per cent at SFU in the same time period since the U-Pass was implemented compared with the fall of 2002. This 53 per cent increase surpassed the estimated 35 per cent increase that was anticipated by UBC and equaled more than 49,000 daily trips by UBC students; ridership increased another seven per cent (SFU) and ten per cent (UBC) in the second year of the program. “We were surprised by the numbers of new riders when we actually tracked it,” said Leicester.

By Fall 2004, one year after the implementation of the U-Pass, 48 per cent more SFU students were riding transit to and from the Burnaby campus; as of May 2005, 81 per cent of SFU students were using their U-Passes with 4 per cent stating they planned to use it; and 88 per cent of SFU students currently use a U-Pass.

“The growth in the Vancity U-Pass program continues to exceed our expectations,” said Translink Chair Doug McCallum. “I think the program has succeeded because it offers students an economical and convenient way to travel without the hassles of fighting traffic or paying for parking.”^{vii}



Creating a Transit Culture

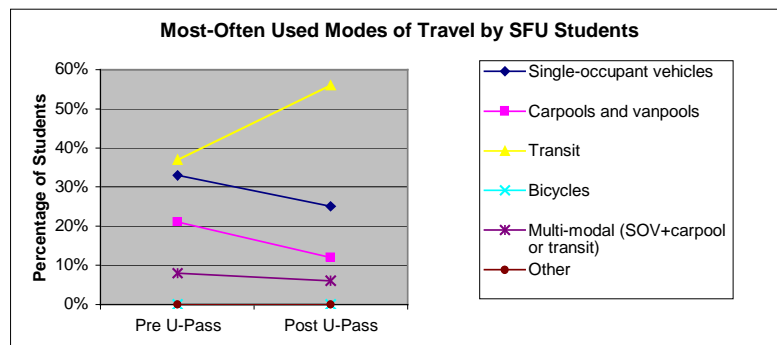
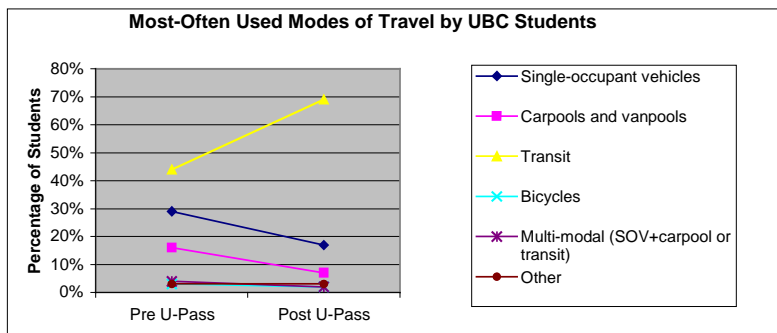
“We hope this [U-Pass] will change transit behavior earlier in students’ lives and that they’ll be more likely to use transit once they graduate,” stated Jan Gunn, internal relations officer with the Simon Fraser student society. “That’s the big benefit for Translink.”^{viii}

Since the students voted in referendums to adopt the U-Pass, all evidence points to the growing “transit culture” among university students. Currently, 63,000 students benefit from the U-Pass program, accounting for a 61 per cent increase in ridership to the two universities since the U-Pass program was implemented in the fall of 2003. Translink has added 12,500 annual service hours to routes to UBC and SFU since 2005, with total U-Pass service hours currently at 73,500.^{ix}

According to Chin, trips off campus have increased since the U-Pass was introduced, combating what he calls the “Gilligan’s Island” effect. “The U-Pass program has had a measurable impact on the range of options available to students for living, working, shopping and going to school.”^x Ian Pattillo, Vice President, External Affairs of the Alma Mater Society at UBC, began his student career at UBC in the fall of 2003 and was among the first beneficiaries of the U-Pass. “I thought it was brilliant,” said Pattillo, “I was living in rez and it was my ticket out of here.”

- One-third of SFU students reported they avoided the need to purchase a vehicle and over 60 per cent reported a reduced reliance on automobiles;
- 37 percent of UBC students reported that they have been able to avoid buying a car as a result of the U-Pass and 69 per cent have been able to reduce their reliance on a car due to the pass;
- Translink’s introduction of the Night Bus service between downtown and the universities, and its need to increase this service dramatically, is anecdotal evidence pointing to the growing transit culture on the university campuses. “We [Translink] found a high percentage [of students] used the NightBus,” said Chin.
- The initial student referendum at SFU in 2003 approved the U-Pass program by only 33 votes. In the March 2005 referendum, SFU students voted 83 per cent in favor of retaining the U-Pass until at least September 2008 – a drastic shift in transportation culture.

“The idea behind the U-Pass is you create a transit culture early on and that will evolve into a transit culture after they [students] leave school,” said Houston. A culture which was quickly adopted by students. “It [U-Pass] gives them [students] the mobility and power to choose where in the GVRD [Greater Vancouver Regional District] they wish to live or go on their spare time. Those are the most immediate benefits and in the long term it gets people in the habit of sustainable commuting on public transit,” stated Pattillo.



Reducing Vehicle Emissions

The City of Vancouver's Community Climate Change Action Plan, completed in March 2005, suggests specific targets for reducing green house gases, including supporting the U-Pass program, which achieves "significant mode shifts from driving." Translink has estimated that by May 2005, regional green house gas emissions had been reduced by 3,000 tonnes as a result of the SFU U-Pass program and 8,000 tonnes as a result of the UBC U-Pass program.^{xi} Current estimates put the U-Pass benefits at a greenhouse gas emission savings of over 16,000 tonnes per year.

As the exclusive sponsor of the U-Pass, Vancity Credit Union is committed to green transportation and environmental sustainability. "Our goal is to work with communities to slow climate change and make our air cleaner. By offering students affordable access to public transit, we hope to encourage choices that will last a lifetime and help improve the environmental health of this region for years to come," said Vancity Chair Bruce Ralston.^{xii}

More Affordable Transportation Options

"When you're on a student income, you're on a fixed income," said Chin, necessitating the need for affordable transportation options for students. During the first two years of the program, the U-Pass was delivered to students at a rate of \$20 per month (UBC) and \$23 per month (SFU). A student referendum at both universities in 2005 overwhelmingly approved a fare increase to \$22 per month (UBC) and \$24.50 (SFU), ensuring the future of the U-Pass system through August 2008. The U-Pass rates, depending on zones traveled, can save individual students hundreds of dollars per semester.

"For the bus riders, which is the majority, it [U-Pass] puts more money in their pocket because they don't have to buy monthly passes or drop cash into the fare box every time they want to ride," stated Pattillo. "Right there you have an immediate benefit to students who are often a little bit cash strapped."

Minimizing Capital Expenditures for Transportation Infrastructures

As a direct result of the increase in transit ridership due to the U-Pass, UBC has deferred the need to build 1,500 parking stalls over the next two years – a cost savings to the university of 20 million dollars. SFU is removing 200 parking stalls and replacing them with only 100. "They [universities] don't want to invest in parking lots, they want to invest in buildings," said Houston. Expanding parking requirements took up space which could be used for other requirements such as student residences. "With the shrinking available land base, especially at SFU, it was in their inherent interest to support the U-Pass," said Houston.

Fare Media Security Solutions

Ensuring the security of the fare media is paramount to the success of the U-Pass system. With over 60,000 U-Passes in circulation, a secure verification system is necessary to track

and identify valid users. According to Translink's Alan Houston, one of the main technological challenges was the need to have security over their fare media. "We needed the serial number for the pass to be associated to the student." A number of options were explored until a solution was found. "One of the main challenges for us was to find a way to get the serial number which is encrypted on the magnetic strip off of there and have it pushed back into the data base," said Houston. They looked to the New York Transit model and the company that did their chip modifications, PICS SmartCard Inc. "It was PICS that came up with the idea that we could have a batch of one or 60,000, it really doesn't matter. And that's the way the system operates," he adds.

"The beauty of the system that PICS designed was that it holds the serial number associated with the control number essentially in escrow. It holds it in the computer until it has a successful print messaging saying that yes, the card is fine. Then it will take that number and put it back into the database. The software is called the PICS Solution," stated Houston.

"Without PICS the U-Pass program wouldn't have come into fruition," said Houston. "PICS has allowed us to venture into the market of period passes for specific groups." Translink must have the ability to cancel passes which are lost, stolen or misused. "That is what the PICS solution does. It provides security over fare media, which is a huge thing," added Houston, because the value of the passes runs into the millions.

Other technological issues arose necessitating PICS SmartCard to create another program to ensure delivery of information to the universities. "Without their innovativeness," stated Houston, "we [Translink] wouldn't have succeeded in the project, because at the beginning of the project there was a lot of ambiguity between the universities and ourselves [regarding the systems]." PICS SmartCard provided a complete end-to-end solution to Translink including the PICS Solution software, photo identification capture stations, specialty printers, and continued service and support. PICS SmartCard maintains and continually updates the PICS Solution software to meet the changing needs of the universities' and Translink's computer systems.

According to Houston, Translink is working towards adding two or three more public post-secondary institutions to the U-Pass system in 2007 with the rest hopefully following in 2008. "We're working right now on how the systems are going to work...and PICS will be on side of course to do the systems development and implement it at each of the different colleges," said Houston.

Period passes issued to government, community organizations, educational institutions, and employers provide a secure and effective utilization of consistent fare media for public transit. Ensuring their security is key to the success of building and maintaining a community's transit culture. The PICS Solution is available for licensing to transit companies wishing to grow their transit ridership with an effective and secure fare media solution.

Conclusion

To date, all goals of the U-Pass system have been met or surpassed. By implementing the PICS Solution, Translink was able to secure their fare media for the U-Pass program and expand the use to production of other passes, including government, community, and

employer passes. Translink currently uses the PICS Solution in the production of over 135,000 period passes annually, generating over \$48 million. Clear sustainable community benefits have been reached with the implementation of the U-Pass program, utilizing the PICS Solution. Since it began in September 2003, the U-Pass program has provided both the University of British Columbia and Simon Fraser University campuses with a low cost transportation option, reduced traffic congestion, slowed or decreased the need for new parking facilities, and reduced the communities' contributions of vehicle emissions into the environment. By ensuring a secure fare media exists for the U-Pass, with the PICS Solution, the program was implemented and continues to grow. "In terms of travel patterns, the U-Pass program has been an overwhelming success, exceeded expectations in shifting trips to transit."^{xiii}

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