
ETS – Fare Evasion Review

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1. Introduction

1.1. ETS Employee's January 4, 2005 letter

On January 4, 2005 an Edmonton Transit System (ETS) employee provided a letter to City Council in connection with fare evasion on the Bus system. The ETS employee's letter estimated a revenue loss due to fare evasion on the Bus system of \$3 million per year. The ETS employee attributed the fare evasion to a number of factors including the following:

- Fare boxes are not adequately designed to allow the Transit Operator to easily determine if the passenger deposited the correct fare.
- Some passengers know that the Transit Operator is not able to determine how much coin is being deposited into the fare box, and throw in whatever they think they can get away with.
- Fare collection is part of the Transit Operator's job description; as a result it is left to the Operator's discretion whether to collect the full fare.
- If the Operator does insist on the passenger paying the full fare (barring exceptional or compassionate circumstances) then the Operator is subject to increased risk of physical or verbal abuse.
- Dealing with fare evasion increases the Transit Operator's stress level, leading to increased sick and stress leave.

The letter also expressed the employee's opinion that management does not provide adequate support to the Transit Operators that attempt to collect full fares. As a result, the majority of Operators choose to exercise their discretion and allow passengers to pay whatever they want in order to avoid a potential confrontation.

1.2. Management Response Letter to Transit Employee Letter

ETS management provided the OCA with a copy of their response letter, dated February 1, 2005, in connection with the above-mentioned Transit employee letter. The response letter was copied to members of City Council. The response letter included the following observations:

- ETS's fare evasion rate is consistent with the experience of other larger transit systems.
- In 2004 ETS collected approximately \$16.5 million in cash revenues on the Bus and Light Rail Transit (LRT) systems.
- In the last 10 years, the cash portion of fare was reduced from 34% to 30% of total revenues.

- The fare evasion rate on the Bus system had not been accurately determined but that management believed that the \$3 million estimate indicated in the Transit employee's letter was overstated.

2. Objectives

The OCA's goal was to review the internal controls designed to manage and mitigate fare evasion, evaluate the effectiveness of the fare evasion controls, and develop recommendations in order to reduce fare evasion. The audit's specific objectives were to determine whether:

- Fare Media and Fare Collection Technology reduce the likelihood of fare evasion.
- Fare enforcement is backed up by adequate security presence.
- A risk assessment system is used to indicate the level of fare evasion activity (high, medium, low) on the Bus and LRT systems.
- Adequate processes exist to ensure continuous monitoring and reporting of fare evasion rates, for both the Bus and LRT systems on a timely basis.
- Adequate reporting of number of assaults against Transit Operators, Inspectors, Transit Security Officers and Passengers is generated on a timely basis, including the root cause for the assault.
- Adequate policies and procedures exist in written format to provide Transit Operators, Inspectors, and Transit Security Officers with the necessary direction in dealing with potentially violent confrontations with Transit passengers.

3. Scope and Methodology

The scope of work covered specific controls to manage and mitigate fare evasion. The scope did not cover controls over the entire cash fare collection process (for example, controls over cash handling, deposit preparation, bank deposit, treasury management and reporting were not included in the review).

The following methodology was used during the review:

1. Interviewed management, Transit Operators, Transit Security Officers (assigned exclusively to the LRT system), and Transit Inspectors (assigned exclusively to the Bus system).
2. Interviewed the Transit Operator that sent the January 5, 2005 letter to City Council.
3. Reviewed directives, procedures, and training material that are designed to manage and mitigate fare evasion.
4. Reviewed routine management reports used to monitor, measure, and mitigate fare evasion on the Bus and LRT system.
5. Researched how other transit authorities deal with fare evasion.

6. Performed “ride-alongs” on five Bus routes with Transit Operators to obtain original data about fare evasion on the Bus system.
7. Performed “walk-alongs” on two LRT shifts with Transit Security Officers to obtain original data about fare evasion on the LRT system.
8. Observed Transit Security Officers performing Proof-of-Payment (POP) checks at Churchill Station.

4. Observations and Analysis

4.1. Fare Media and Fare Collection Technology

In the month of March, the OCA conducted a limited and non-scientific sample of both the Bus system and LRT system to estimate fare evasion rates for ETS. The OCA observed for the Buses there were effectively 29 evaders (19 observed and 10 estimated from cash shortage) out of 2,336 passengers for an estimated fare evasion incident rate of 1.2%. The OCA observed for the LRT there were 142 evaders out of 2,382 passengers for an estimated fare evasion incident rate of 6.0%¹. The estimated annual revenue shortfall due to fare evasion is approximately \$967,000 for the Bus system and approximately \$664,000 for the LRT system.

From interviews with Transit Operators, Transit Inspectors, and Transit Security Officers and from field observations, the OCA noted several different types of fare evasion. The typical fare evasion techniques used on Buses are: claiming to have no money for fare, short changing fare payment by using a large amount of small coins, use of senior or student pass in place of adult pass (typically a student pass), expired transfers and tickets, abuse of ticket booklets through improper validation (stamping on the wrong side or not validating the ticket), and counterfeiting of Bus passes.

The typical fare evasion techniques used on the LRT are: non-payment, abuse of ticket booklets through improper validation (stamping on the wrong side or not validating ticket), covering a ticket with clear tape allowing the validation stamp to be rubbed off, use of senior or student pass in place of adult pass, and use of expired tickets or transfers.

The fare boxes on Buses do not allow the operator to easily count money deposited during the day, and the lack of fare box lighting makes it extremely difficult to see what has been deposited at night. Subsequently it is very easy to short-change the Bus system. Also when tickets are deposited in the fare box, they very often flip over making it impossible to see if they have been properly validated (when applicable).

Adult, Senior, and Student Bus passes are distinguished only by the word adult, senior, and student printed vertically on the left hand side of the pass. Often, passengers attempting to use an invalid pass will attempt to cover-up this side of the pass when

¹ The evasion incident rate on the LRT system has spiked up to 5++% commencing in 2003 as follows: 1997-2.7%, 1998-3.2%, 1999-2.8%, 2000-3.4%, 2001-3.3%, 2002-3.3%, 2003-5.0%, 2004-5.9%.

“flashing” it to the Transit Operator. The limited distinctiveness of the various passes contributes to the difficulty Transit Operators face in enforcing fare payment – especially during peak boarding hours. ETS management advised the OCA that a significant effort is made to ensure Bus passes are designed to be as distinctive as possible.

The wide distribution and access for purchasing adult, senior, Disabled Adult Transit (DATS) pass and tickets at various convenience outlets allows anyone to purchase these types of fare media regardless of eligibility.

Comparisons were made to reported fare evasion incident rates for both Calgary Transit and Vancouver’s TransLink. Calgary has an evasion rate of 1.5% for its C-Train, whereas TransLink evasion rates are 2.0% for Buses and 5.0% for the Sky-Train². These evasion rates were not reviewed by the OCA for accuracy or completeness. Calgary does not track fare evasion rates on its Bus system.

Edmonton’s estimated fare evasion rate for the bus system is consistent with industry standards. However, Edmonton’s estimated fare evasion rate for the LRT is substantially higher than Calgary’s C-Train and slightly higher than Vancouver’s Sky-Train while the volume of passengers is significantly less (42,000 boardings per weekday for Edmonton versus 220,000 and 205,416 boardings per weekday for Calgary and Vancouver respectively). Also Calgary’s evasion rate for the C-Train was about 7.4% in 1993 and was driven down to about 1.3% in 1994 through persistent, proactive fare enforcement by security personnel. Since 1994, the C-Train evasion rate has mostly been within the 1% to 2% range and always under 3%.

The OCA reviewed the types of fare media and fare collection technology available. The type of fare media available and in use by different transit authorities includes; tokens, passes, paper tickets, magnetic stripe cards, and electronic stored value or “smart cards.” Of these fare media, electronic stored value or “smart cards” have the greatest potential for meeting fare collection needs but come at the highest cost. Tokens, passes, paper tickets, and magnetic stripe cards are relatively less expensive. Both smart cards and magnetic stripe cards are a form of stored value card that can be used to store prepayment of fares.

More information can be stored on smart cards than on magnetic stripe cards and they can either be a non-contact or contact card. Non-contact smart cards work by using proximity sensors to read and write information to the card allowing for a more rapid boarding of Buses than contact smart cards and magnetic stripe cards.

Both smart cards (contact and non-contact) and magnetic stripe cards are used in conjunction with electronic registering fare boxes mounted with either proximity sensors or swipe readers. These electronic fare boxes record the value of coinage deposited

² TransLink uses two metrics for measuring fare evasion; the fare evasion rate based on incidents of fare evasion and the percentage of revenue loss from fare evasion. The fare evasion rate reported here is based on the number of incidents of evasion on Sky-Train.

and display this amount to the driver. Fare evasion incidents can be recorded by the number of times the override button was pushed by the Transit Operator.

Given that ETS management has expressed an interest in eventually moving toward the use of smart cards, the OCA researched this technology, and provided ETS with a potential “fare collection system” for information purposes. The OCA believes that ETS needs to conceptualise a potential fare collection system, on a cost effective basis, that in combination with improved security and policy changes would reduce fare evasion rates. (*Recommendation #1*).

4.2. Fare Enforcement and Transit Security

Interviews with Transit Operators and a review of records of past assaults indicate that assaults and threats to operators, inspectors, transit security officers, and the general public are a real risk. Enforcement of fare payment is left to the discretion of the operator and is one of the most difficult tasks assigned to the operator position. An operator may face an increased risk of vulgarity and the threat of violence when requesting fare from a passenger, particularly if the passenger is impaired in any manner. This in turn contributes to a diminished sense of security among both Transit Operators and passengers. The OCA believes that increased security presence is warranted for the Bus system. This could be accomplished using intelligence-based deployment of fare agents and Transit Security Officers (TSO) onto Buses at identified problem terminals through the use of fare payment checks, where all Bus passengers’ passes and transfers are inspected. For identified problem routes, either uniformed TSO or plain clothes TSO could be deployed to enforce fare payment and to improve security through regular on-Bus patrols.

ETS management conducted a security review of ETS Security because of the increased risk of violence against ETS employees and passengers, property damage and vandalism. This review (completed in 2004) was conducted by an engineering consulting firm working in conjunction with two security firms. The OCA reviewed the consultant’s report entitled, “Transit Security Best Practices Review: A Strategic Approach for the Future.” The report outlines the direction that ETS has chosen to take in improving security on Edmonton’s transit system. During this review, the consultants examined best practices for security within the transit industry. Direct comparisons were made to five other major Canadian municipalities, with Ottawa and Calgary being considered the most comparable to Edmonton. The comparison covered a variety of security functions such as general security, risk management, security staffing levels, deployment of security personnel, use of force, and security equipment and systems. Based on the recommendations in the consultant’s report, Transit Security is moving toward a platoon shift system, possibly using special constables, and deploying security personnel based on assessment of risk exposures.

Transit Security has twenty-eight full time positions in total, including nineteen TSOs. Two TSOs are dedicated to a mobile unit that patrols the Bus terminals while seventeen work on the LRT system. There are also seven positions in the security control centre and three supervisor positions. Transit Security also maintains a pool of casual workers

to backfill positions. Transit Security has experienced difficulty in backfilling positions using casual workers because those individuals can choose which days and times they will work.

The 2004 report on transit security indicates that ETS Transit Security is under-resourced and lags other transit authorities by 16 to 21 security personnel given the size of Edmonton's transit system. The report states that a minimum of 34 security personnel are required to be deployed in the field. The proposed organizational structure for Transit Security includes one general supervisor, one and one-half administrative assistants, one security analyst, six shift supervisors, twenty-four TSOs, four fare agents, six security room monitors, two investigators, one training officer and twenty-two casual relief workers. With this organization structure there would be up to 34 personnel deployed that can be used for fare enforcement. Given the under-resourced deployment of security personnel identified by the security review, the OCA believes that a further assessment of Transit Security staffing levels should be conducted following the re-organization. The purpose of this assessment would be to ensure that effective fare enforcement can be established on the Bus system through on-Bus checks and regular on-Bus patrol of problem routes and runs (*Recommendation # 2*).

4.3. ETS Risk Assessment System

Through interviews with management and review of management reports, the OCA observed that ETS has not implemented a comprehensive risk assessment system to measure the level of risk of fare evasion activity on the Bus and LRT systems. The purpose of a risk assessment system is to provide management with information about where fare evasion activity is more likely to occur on the Bus and LRT systems. Without a proper risk assessment reporting system, it is difficult to accurately determine where the high risk areas are and to deploy sufficient resources into these areas. Measuring fare evasion risk levels also provides management with information connected to other security-related issues on the Bus and LRT systems such as robbery, assault, and vandalism.

In response to the above-mentioned "Transit Security Best Practices Review: A Strategic Approach for the Future" report, ETS recently hired a security analyst (a new position within ETS) to perform the following functions:

- Manage Security Information System
- Prepare statistical reports
- Analyze incident data and make recommendations
- Draft Standard Operating Procedures and Co-ordinate development and review processes
- Conduct/research incident trend assessments

As part of their work, the Security Analyst will draft new Standard Operating Procedures (SOP's) that will address several security issues. The OCA anticipates that "best practice" SOP's will be developed to ensure that the most cost-effective security methodologies are employed. This should include the use of an effective risk

management reporting system to monitor fare evasion levels on a continuous basis in conjunction with other security risks such as robbery, assault, and vandalism (*Recommendations #3*).

4.4. Monitoring and Reporting of Fare Evasion Rates

The OCA noted during its field observations of the Bus and LRT systems that a certain level of fare evasion is inevitable. However ETS has not determined what the minimal level of fare evasion should be for either the Bus or LRT systems. This is due, in part, to the lack of a reporting process to provide timely and accurate monitoring of fare evasion rates and the amount of lost revenue (*Recommendations #4*).

4.5. Reporting of Assaults on Transit System

Transit Operators, Inspectors, and Transit Security Officers may be subject to assault from passengers. Transit Management, Transit Operators, and Transit Security Officers indicated confrontations arising from addressing incidents of fare evasion was one of the root causes for violence against ETS employees. In reviewing assault reports, the OCA found that summary reports are not provided on a timely basis and do not contain information identifying the root cause for the assault.

The assault data provided by management to the OCA from 1996 to July 2004 is as follows:

ASSAULTS/THREATS ON OPERATORS

	1996	1997	1998	1999	2000	2001	2002	2003	2004 (July)
ASSAULTS	24	34	23	25	21	28	28	60 ³	22
THREATS	40	29	25	15	12	2	5	4	1

ASSAULTS/THREATS ON INSPECTORS

	1996	1997	1998	1999	2000	2001	2002	2003	2004 (July)
ASSAULTS	11	1	1	3	3	0	3	2	3
THREATS	7	6	3	0	0	0	0	2	2

ASSAULTS/THREATS ON TRANSIT SECURITY OFFICERS

	1996	1997	1998	1999	2000	2001	2002	2003	2004 (July)
ASSAULTS	18	9	9	11	3	6	4	8	10
THREATS	9	19	10	4	2	0	3	0	3

The OCA observed that the current process does not allow for timely summary reporting of assaults on Transit Operators, Inspectors, Transit Security Officers, and passengers for either the Bus or LRT systems. The OCA believes that adequate and timely reporting of assault information is required to determine developing trends so that pro-active strategies can be employed to reduce the number and frequency of assaults against ETS employees and passengers (*Recommendation #5*).

³ ETS indicated that one of the factors for the increase in the number of assaults compared to prior years is due to the increased awareness that ETS employees have about violence in the workplace.

4.6. Policy, Procedures and Guidelines for Workplace Violence

Administrative Directive A 1438, *Workplace Violence*, issued May 18, 2004, provides high-level guidance on managing workplace violence. This Directive helps to ensure that the City develops and maintains violence prevention practices in all departments to create a respectful work environment and complies with the Alberta Occupational Health and Safety (OH&S) Act, Regulation and Code.

The accompanying Administrative Procedure A 1438, issued May 18, 2004 provides for the following procedures and guidelines about the topic of workplace violence:

1. Supervisors will integrate workplace violence prevention into the Department's OH & S Program.
2. Supervisors shall consider workplace violence as a hazard when conducting hazard assessments and employees will participate in the process.
3. Supervisors will provide instruction to employees on how to recognize workplace violence and procedures for reporting and investigating.
4. Supervisors will investigate reported incidents of workplace violence in a timely manner.
5. All employees will participate in a cooperative manner with any investigation.

The OCA noted that ETS has developed appropriate training material in response to the "Workplace Violence" issues as noted per Administrative Directive and Procedure A 1438. However "Workplace Violence" topic does not appear in the ETS Operator Information Manual.

The OCA believes that the ETS Operator Information Manual needs to be updated to provide more adequate guidance about "Workplace Violence" as cited per Administrative Directive A1438 and Administrative Procedure A 1438 (*Recommendation #6*).

5. Conclusion

The OCA's research of transit systems across Canada, the United States, Europe, and Australia indicates that fare evasion is an industry-wide problem. Our research indicated that a certain level of fare evasion is inevitable but can be minimised through an effective combination of "best practices" that include fare collection systems, fare collection policy, procedures, and security.

ETS management has taken the first step towards reducing fare evasion and improving security by completing a comprehensive review and 2004 report entitled "**Transit Security Best Practices Review: A Strategic Approach for the Future**".

The OCA believes that fare evasion can be reduced, and operator and public safety enhanced by;

- Changing fare collection systems and policies,
- Generating timely and routine reporting of fare evasion rates, risk levels, and associated revenue loss,
- Generating timely and routine reporting of assaults including root cause analysis,
- Restructuring the transit security function as recommended per the 2004 Transit Security report, and
- Increasing the presence of Transit Security personnel on the Bus system for effective fare enforcement and improved security for ETS employees and passengers.

The OCA thanks both ETS management and employees for their co-operation and valuable insight provided during this review.

6. Recommendations and Action Plans

Recommendation	Management Response
Fare Media and Fare Collection Technology	
<p>1. That Management envision a potential fare media and fare collection system, on a cost effective basis, that would minimise fare evasion. This would include examining the control benefits for the use of the different types of fare media.</p>	<p>Accepted <i>Target Date:</i> January 1, 2007 <i>Responsible Party:</i> Business Development</p> <p>Edmonton Transit has an on-going program related to the development of an advanced fare collection system. This system encompasses smart card technology which would provide opportunities to reduce fare evasion through implementing strategies such as reducing the number and type of fare media and facilitating increased controls and information. A business case for this advanced fare collection system has been developed and the entire program is currently being assessed through the City’s “value management” evaluation program. Pending the outcome of this exercise a funding impact will be presented through the budget process.</p>
Fare Enforcement and Transit Security	
<p>2. That Transit Security increase the number of fare evasion checks on Buses at problem terminals and establish regular on-Bus patrols on problem routes and runs that are identified through risk assessment information. This would include the provision of adequate Transit Security staffing to ensure sufficient resources are provided for fare enforcement and security on the Bus system.</p>	<p>Accepted <i>Target Date:</i> January 1, 2007 <i>Responsible Party:</i> Operations</p> <p>With the implementation of the new security service provision model, with its attending increase in response personnel, Edmonton Transit will initiate the plan of action in support of the fare evasion enforcement program. With one year of experience with the increased security resources as identified in the new security model, Edmonton Transit will complete a review of security needs to assess whether the available resources adequately meet corporate objectives.</p> <p>Edmonton Transit currently conducts fare evasion blitzes at selected terminals and on-street locations based on statistical information and public and operator concerns. With the introduction of the POSSE security reporting software program, the ability to analyze statistical data related to problem runs and locations will be enhanced. From this information, Edmonton Transit will develop a program to increase the number of on-bus fare evasion checks and by identifying problem runs proactively address identified contributing factors.</p>

Recommendation	Management Response
ETS Risk Assessment System	
<p>3. That the newly hired Security Analyst develops a risk assessment system in conjunction with the Security Information System to measure the fare evasion risk levels on a continuous basis for the Bus and LRT systems. This would include updating the ETS Operator Information Manual (when the next revision is scheduled for release on January 2007) to incorporate best practices for dealing with fare evaders following implementation of the fare evasion risk assessment system.</p>	<p>Accepted <i>Target Date:</i> January 1, 2007 <i>Responsible Party:</i> Operations</p> <p>Edmonton Transit currently measures and reports fare evasion rates on the LRT system on a monthly basis. This information is not gathered on the bus system due to the labour intensive nature of gather bus fare evasion data.</p> <p>The recently hired Security Analyst is in the process of developing a comprehensive risk assessment process related to fare evasion on the LRT system. This program will continue to report monthly on ETS experience. Additionally, Edmonton will commence a program of assessing bus fare evasion rates on a consistent basis as well. A rate of reporting which supports a rational performance management system will be established. In the next revision to the Operator’s Manual in 2007, Edmonton Transit will include updated directives for operation staff relating to fare enforcement guidelines reflecting “best practices” within the Canadian transit industry.</p>
Monitoring and Reporting of Fare Evasion Rates	
<p>4. That processes and controls be developed in order to provide continuous monitoring and reporting of fare evasion rates, including estimated revenue loss caused by fare evasion for both the Bus and LRT systems.</p>	<p>Accepted <i>Target Date:</i> January 1, 2007 <i>Responsible Party:</i> Operations</p> <p>Edmonton Transit will develop the necessary programs to ensure a continuous monitoring and reporting of fare evasion rates on both the bus and LRT systems. This program will identify fare evasion check frequency, check methodology and assign resources to ensure a vital on-going performance measurement program is in place. The data gathered from this performance measurement program will allow for the provision of an estimate of revenue loss through fare evasion on both the Bus and LRT systems.</p>

Recommendation	Management Response
Reporting of Assaults on Transit System	
<p>5. That processes be revised in order to provide timely summary reporting (on a monthly basis) of assaults. The summary report should also be classified by “root cause of the assault” in order to allow for management to plan pro-active strategies to reduce the number and frequency of assaults.</p>	<p>Accepted Target Date: January 1, 2006 Responsible Party: Operations</p> <p>Edmonton Transit has recently implemented the new POSSE security reporting software program. This system will facilitate a more comprehensive analysis of all assault data. The data will allow for root cause analysis and the identification of problem routes, high threat locations, high probability time frames as well other contributing factors. In addition, this data will enable ETS to identify training requirements and enable this training to be focused appropriately.</p>
Policy, Procedures and Guidelines for Workplace Violence	
<p>6. That the ETS Operator Information Manual be updated (when the next revision is scheduled for release on January 2007) to incorporate the workplace violence policy statement, procedures and guidelines as required per Administrative Directive A 1438 and Administrative Procedure A 1438.</p>	<p>Accepted Target Date: January 1, 2007 Responsible Party: Operations</p> <p>Edmonton Transit has developed, with the assistance of the National Transit Institute from Rutgers University, a comprehensive “Violence in the Transit Workplace” training program. The training has been given to all current staff of Edmonton Transit and is given to all new employees during their orientation and training program.</p> <p>The ETS program is the model for all City of Edmonton “violence in the workplace” training and meets the requirements of Administrative Directive A 1438 and Administrative Procedure A 1438.</p> <p>The revised Operator Manual, when issued in 2007, will refer to this training and contain specific reference to Administrative Directive A 1438 and Administrative Procedure A 1438.</p>