

An Investigation into Security and Accessibility in Single-Stall Washrooms at UBC

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ABSTRACT

This report evaluates the most appropriate security measures that can be applied to single-stall washrooms (SSWs) in UBC, as well as making them more accessible all while maintaining the triple bottom line (TBL) approach. The results were obtained from both primary and secondary research. The secondary research comprises sources from previous stall security issues where implementations that worked were reported in studies. The primary research is a survey conducted on 18 students of UBC.

In this report, two main solutions to the core issue of security against vandalism in SSWs are confirmed from preliminary secondary research. The first solution is usage of a lock and key system where students and faculty can access the washrooms with their respective university ID cards. The second solution is installation of security cameras outside of the single stall washrooms, ensuring a higher level of accountability. In terms of accident reduction and accessibility of these stalls, a recommendation for anti slip floors and strategically placed hand rails is recommended in this study.

After primary research had been conducted, it was understood that students and certain staff had expressed their dislike for key card access due to varying reasons, the main one being the issue of requiring to keep their cards on their person at all times in order to use bathroom facilities. Cameras are therefore the primary choice for added security measures, yet it must be noted that there were concerns of privacy. Therefore, it is recommended to highlight where cameras are installed, and avoid invading any privacy. The cameras should only be able to identify individuals exiting and entering the SSW, and no interior shots of the bathroom should be in sight of the camera range.

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GLOSSARY

Triple Bottom Line:

An accounting framework composed of three parts: social, environmental, and financial. It is used in evaluating an organization's performance.

LIST OF ABBREVIATIONS

Single-stall washroom (SSW)

Triple Bottom Line (TBL)

University of British Columbia (UBC)

1.0 INTRODUCTION

The purpose of this report is to find a solution to vandalism and misuse of SSWs and increase the level of accessibility to all who use washrooms. The initial research was based on secondary sources that allowed formulation of solutions that were then critiqued by students through an online survey. The preliminary research primarily consisted of peer reviewed articles and journals. Before beginning the research, a question and answer session was held with the client. Several questions were asked to narrow the scope of the research. The main driving question which guided the research was: “How can we prevent vandalism in single-stall washrooms?”

In order to correctly answer the question, a complete analysis needs to take place. Applying a TBL allows for a fuller solution where social, economic, and environmental factors are all accounted for. After identifying the correct indicators, the solutions from secondary research can then be effectively critiqued.

Following this, a basis for a survey to present students with was designed. The survey allowed an understanding of whether the solutions cameras and/or key cards were preferred. By surveying the public, a decision can be made as to which solution is socially more appropriate.

2.0 INDICATORS

To measure the effectiveness and sustainability of the proposed solutions, several indicators have been explored. The following sections will discuss social, economic, and environmental indicators. These indicators will be used as part of the TBL analysis.

2.1 SOCIAL

One social indicator that is important to the research is vandalism rate. Although vandalism rates are not logged, one may be able to extrapolate this through janitor logs and other documents that contain information about the cost of repairs for SSWs. For this indicator, one only needs to measure the amount spent on repairs. The higher the repair costs, the higher the vandalism rate. In this case, lower repair costs is the goal.

The problem with this indicator is that it is inaccurate, and does not directly link to the act of vandalism that was described above. Higher repair costs may be due to other factors such as wear and tear of old systems. Another indicator that could be of use are crime statistics. From these, one can explore the security aspect of the research, which is not limited to vandalism. Here, the preferable outcome is the lowering of crime rates. Another important social indicator is the sense of safety of an individual; in other words, does the individual feel safer with the proposed technology? To measure this, one can use a survey to ask the public (i.e. students, staff, visitors, etc.) about their stance on safety with respect to the implementation of technological solutions. Higher safety among the majority will yield a higher value in a TBL calculation. The proposed solutions will raise privacy concerns, so another indicator that will be used is the

acceptance rate of the proposed solutions, which can be measured through surveys. This was a major component in choosing the most viable technological solution.

2.2 ECONOMIC

An economic indicator pertaining to the research is the cost of installing security features which is covered in the capital costs. This includes the cost of training employees, if applicable, as well as the cost of maintenance. This is important to the research as there is a budget of \$500,000 for the implementation of technological solutions. Note that this is the best case scenario, as it is a federal grant; the actual budget may be lower.

Costs are accounted into the solutions and are a major factor in deciding the most appropriate solution, as going over budget is not a feasible solution. Therefore, careful consideration must be taken when deciding on which solution to implement.

2.3 ENVIRONMENTAL

To measure the environmental aspect of the TBL analysis, one can look at the amount of toilet paper waste that is produced or used in a SSW as well as the quantity of water that is used. The expected outcome of this measurement is that higher security measures will reduce the amount of toilet paper waste and water usage as a result of lower rates of vandalism and other factors.

The security measures also serve to act as a method of making individuals feel more accountable when it comes to excessive usage and theft. Human nature tends to want to avoid potential conflict, and therefore increasing the potential for identification should help reduce excessive usage and theft. Ideally, this will help reduce the environmental waste that is caused by the excessive use and theft of toilet paper and water.

3.0 ACCESSIBILITY

The research into accessibility of SSWs at UBC will focus on the absence of accessible technology. The technologies that will be discussed in this section are automatic drying systems, vacant and engaged signs, and soap dispensers.

There is a lack of automatic drying systems in SSWs. Research in accessible design suggests that washrooms should implement automatic drying systems, as they yield a 90% reduction of operating costs (Washroom facilities, 1987). This technology also reduces environmental impact as paper products may not be needed any more in SSWs. Assuming that there are approximately 50 SSWs at UBC, the total cost for an automatic drying device in each SSW ranges between \$45,000 to \$75,000.

Besides the lack of automatic drying systems, there also seems to be a lack of repairs on vacant and engaged signs for SSWs. For example, some washrooms in the MacLeod Building are missing the vacant and engaged signs. This lack of communication between users may lead to privacy invasion. A user may forget to lock the door, and without a sign to indicate that the washroom is currently in use, another user may think that it is free and proceed to unintentionally invade the other user's privacy.

An observation through on-site visits shows that excess paper used in drying hands are being used for catching/absorbing the leftover drips from the automatic and push-operated soap dispensers. This information leads to further support in the transition of paper based hand drying products to automatic hand drying technology. A more hygienic alternative to the current soap dispensers is elbow-operated soap dispensers.

4.0 SOLUTIONS

Solutions are presented in numerous case studies. Understanding that each case has its unique traits, further research of these solutions were required. The initial phase of research presented two main solutions that were then further analyzed.

The first solution is the use of key cards. Essentially, this solution proposes that members of faculty and students carry their UBC identification whenever attempting to access single stall washrooms in order to help account for and track individuals accessing the washrooms. By doing so, it is assumed vandalism rates would decline due to the high level of accountability and risk of identification.

The second solution that had been cited from case studies is the installation of security cameras outside of the single stall washrooms. The installation of these cameras would essentially have the same effects as key cards; however, they would be accomplished through different means. The cameras would be placed to avoid interfering with privacy and would only monitor hallways/exits of SSWs. Ideally, the cameras would make members of the public refrain from misusing stalls.

4.1 KEY CARDS

One solution explored was the usage of key card access (Silva, 2012). The key card solution would require students and staff to carry their UBC card or some other form of identification to access single stall washrooms. By using student cards and staff

ID, the washrooms would be accessed similarly to how private access rooms in UBC are accessed. This also allows for logs and records to be kept in case of any vandalism or related incidents. Consequently, users would have a feeling of responsibility and accountability towards the SSW that they occupy.

A notable issue of using key cards, however, is that it restricts non-students and non-staff from easily accessing SSWs. The repercussions of this is that handicapped individuals who are not UBC staff or students can have issues accessing the bathrooms. It also requires students and staff to have to carry their key cards in order to have access to a SSW.

The primary research conducted, a survey of UBC students, revealed as much. Of the 18 respondents, 83.33% said they did not think SSW access should be limited to those with key cards. Because of this large percentage, key cards were determined to not be a viable solution, and an extended cost analysis is hence omitted.

4.2 CAMERAS

Another solution explored was the use of security cameras (Shroades, 2006). Clearly, there are major privacy concerns with this solution. The proposed solution must then respect the public's privacy and their right to information regarding their surveillance. To make things clearer, this section will go into details about the exact implementation, as well as some TBL indicators that pertain to this solution.

The surveillance camera will be placed outside of SSWs. Additionally, there will be a limited viewing range, and the cameras will be unable to look inside the SSW under any circumstance. Below is an image of the expected view range highlighted in green (see Figure 1). Other notable surveillance camera regulations include informing the

public of such practices via signs and keeping recorded images in a secure location (Office of the Privacy Commissioner of Canada, 2008). These regulations must be followed to ensure legal use of such technology.

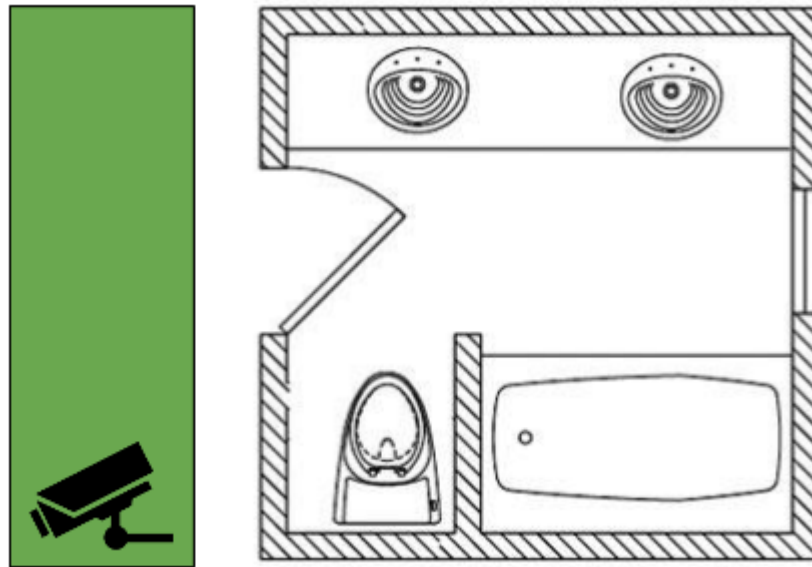


Figure 1. View Range of Security Camera

The following is a list of relevant social indicators: vandalism rate, crime statistics, sense of safety among public, and acceptance rate. For normal security cameras, it is expected that crime rates will drop by 21% (Isnard, 2001). Other areas to explore include the sense of safety among the public; a survey can be conducted to extract this information. As for the acceptance rate, primary research was done targeting UBC students. The resulting 18 responses concluded that 33.33% of students were accepting of the implementation of cameras outside of SSWs (see Figure 2). The 22.22% that had no opinions suggests that they do not mind the cameras. It is important to note that the survey results may be skewed due to the ambiguous nature of the survey. Further research in this area should make it clear that these cameras will not be monitoring the entrance of the SSW, but rather the path leading up to it, much like the one seen in Figure 1. This may be the cause of the 38.89% objecting to the camera implementation. Future surveys should also address a wider range of audience rather

than students of UBC, as SSWs are accessible by anyone, including faculty, staff, and visitors.

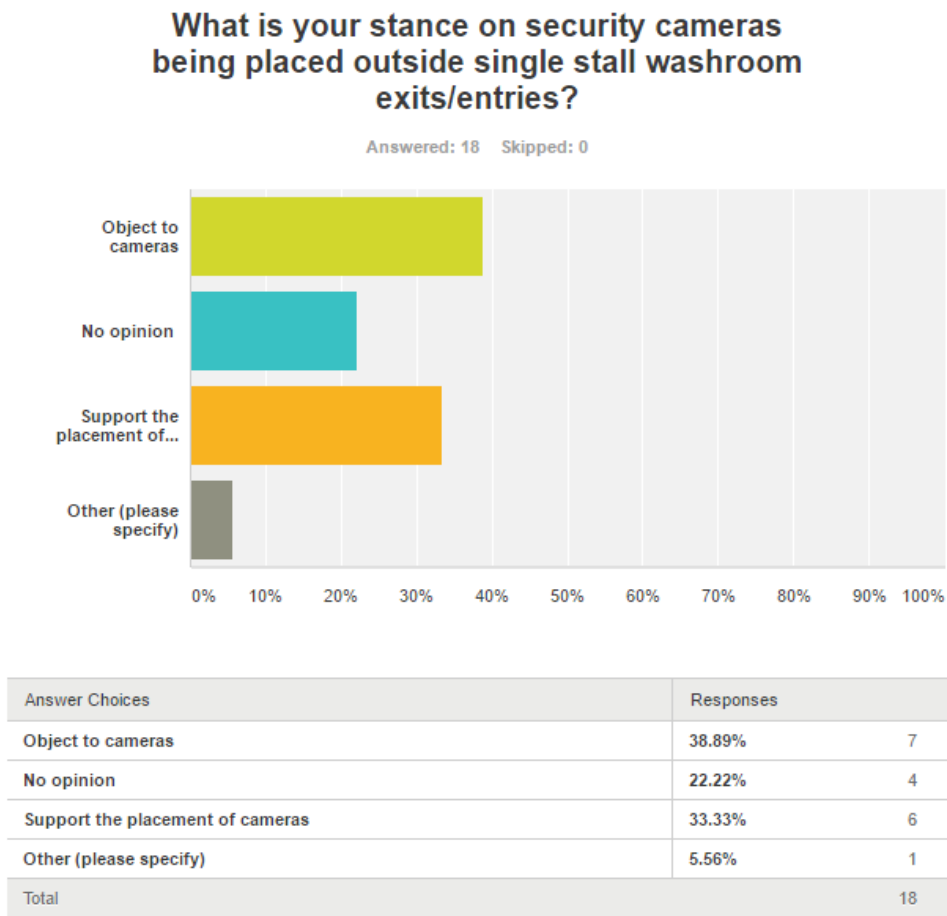


Figure 2. Security Camera Survey Results

A downside to this is that it is a costly solution when compared to the key card solution. Once information pertaining to how many SSWs are to be installed with cameras is obtained, a simple multiplication can be used to find the capital cost associated with this particular solution. There are approximately 50 SSWs on campus, and each camera comes in at an average cost of approximately \$150. Thus, the approximate cost of getting security cameras for all SSWs is \$7,500. While this is well within the \$500,000 grant that is being applied for it is still more costly than the key card solution, and does not include the cost of installation and maintenance.

Furthermore, an analysis of savings could be done by evaluating previous repair costs due to vandalism and calculating the savings that could be found through the prevention of vandalism and subsequently the reduction of repairs.

In addition to the social and financial indicators, one can measure the annual usage of toilet paper. As users are expected to feel more accountable for their actions due to the cameras, they will be less likely to vandalize the SSWs. In this context, vandalism will be the excessive use of toilet papers and water.

5.0 CONCLUSION AND RECOMMENDATIONS

In this report, the problem of increasing accessibility and security of SSWs was examined. A TBL approach was used to determine the effectiveness of two potential solutions: key card access and security cameras. The former was determined to be too cumbersome and limiting, while the latter was found to be more effective and accepted by the general public. These results were obtained by secondary research of published material pertaining to these solutions, as well as a primary research survey of UBC students.

The main recommendation, then, is to install security cameras outside SSWs at UBC. Of course, privacy issues pertaining to the cameras must be kept in mind, so care must be taken to only monitor the surrounding area, rather than the entrance of the SSW itself. The cost of implementing this solution is at least \$7,500 for installing a camera outside each SSW on campus; this cost only includes the cost of each camera, and does not include installation and operation costs.

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APPENDICES

Survey Questions

1. Do you think washroom access should be limited to those with key cards (ie students and staff)

2. How big a problem is washroom security and vandalism is on campus?

- A major concern
- A minor concern
- Haven't thought about it
- Other (please specify)

3. Would you prefer a separate access card to access washrooms or for the accessibility of washrooms to be integrated into your student card (ie can access washrooms using your student card instead of a new separate card)?

- Washroom card integrated into student card
- Washroom specific card
- Doesn't matter
- Object to any form of key card access
- other

4. Where would you recommend higher security measures be implemented on campus? (List as many locations as you feel are necessary or relevant)

5. What is your stance on security cameras being placed outside washroom exits/entries?

6. If you have any other security measures you would like to suggest or have anything to add about security in washrooms please mention it below