

Implementing A New Elevator System Proposal

(What this budget-friendly solution can do to improve the North Academic Center)

By Carter Le, Genesis Olivero, Miguel Gomez, Anvarjon Nurakhunov

Writing for Engineering
Nov, 20th 2019

Table of Contents

Purpose	1
Summary	1

Introduction	2-3
Proposed Tasks	3-5
Schedule	5
Budget	5-6
Qualifications and Experiences	6
References	6

Date: 11/20/2019
To: David Robinson
Assistant Vice President of Facilities

City College of New York
From: Miguel Gomez, Carter Le, Genesis Olivero, Anvarjon Nurakhunov
Subject: Addition of Limited Use Limited Accessibility Elevators in the North Academic Center.

Purpose

The purpose of this proposal is to inform Mr. David Robinson of a feasible solution to improve the elevator system in the North Academic Center (NAC) building.

Summary

The elevators in the North Academic Center (NAC) are inefficient and do not meet the high demands needed from them. Students, faculty, maintenance workers and other outside parties use these elevators. The elevators are also the only means of getting to floors higher than the 5th floor for those physically impaired. The overcrowding of the elevators forces students to take the escalators instead. This, as a consequence, has caused many of the escalators to need repair work, and it is done frequently. However, the escalators are not an acceptable alternative to those who are physically impaired. We offer a possible solution. Limited Use Limited Access (Lu/La) elevators are what we have researched and decided to be the best suited. They are relatively cheaper than ordinary commercial elevators, smaller, and require less maintenance. They also meet ADA (American with Disabilities Act) requirements. Lu/La elevators can be installed in the staircase near the current elevators of the NAC. With the addition of Lu/La elevators, City College will be able to reap its benefits in just four years. Maintenance costs, risks of possible escalator-related injuries and heavy traffic are lowered. This makes the NAC building a safer environment.

Introduction

Currently, the elevators in the NAC are being used by staff, faculty, delivery service people and students. The elevators in the NAC are not specified as a passenger or service elevator. As a consequence, there is a huge range of people that are able to use it. This caused an increase in demand for the elevators and introduces mechanical defects. These issues lead many students and faculty to take the escalators instead. Those with physical disabilities have difficulty reaching the highest floors as the elevators are very slow and full. They wait a considerable amount of time for the elevator and when the elevator does arrive, it is either full of people or equipment. This, in turn, becomes troublesome as City College holds a policy for tardiness. Generally, tardiness and its equivalence depend on the professor. We propose that Lu/La elevators be installed. The consequences of not doing so can lead to escalator-related injuries (due to increasing use).

With such high traffic and demanding use for the elevators, many decide to take the escalators. This has prompted great use for it. With so many people now using the escalators, the chances of malfunction and possible injury increases. One of the common reasons for malfunctioning escalators is obstructions. This comes from the passengers themselves, coins, pencils, pens, and many other small objects. This, in combination with the number of people using it, may lead to a disaster. Back in October of 2018, a disastrous escalator accident occurred in Rome at the Teatro dell'Opera station. This was due to the number of people present and the overstressing of the escalator. One of the riders had his foot amputated because of the incident [1]. This occurred at a train station where heavy loads and traffic is to be expected throughout the day and night. The escalators in City College are not meant for such constant heavy loads. The incident at Rome could happen again at CCNY if future actions are not taken.

We have also considered several possible locations for new elevators, but we ultimately decided on one. We considered the new elevators to be placed attached to the building. We decided that due to costs and security reasons this was not feasible. We also considered placing the elevators in between the escalators on the ground level. This way the new elevators would parallel and face the older elevators. However, the installation and demolition for a new shaftway would be expensive, interrupt foot traffic, and it would take up more time to complete. Our group decided that the best location to install the elevators is in the staircase adjacent to the current elevators. It would be placed in the center of the staircase. The area is currently occupied by a steel cage mesh. This area is a great fit for Limited Use Limited Accessibility elevators because the elevators do not require a lot of space.

In order to avoid overcrowding, increased possibilities of injuries and complaints, we propose the installation of Limited Use Limited Accessibility Elevators. Doing so may even avoid possible lawsuits, that may include injury or ADA violations. The following information is the research our group gathered. We prioritized feasibility and we believe our proposal is best suited to meet the needs of both the students and the college.

Proposed Tasks (Plan of Work)

Task 1: Research the most appropriate elevators - We've been looking into various types of elevators. We believe that Limited Use/Limited application elevators are the most effective type. They are smaller, cheaper, and easier to maintain than normal elevators. While the current elevators are used for a mixed-group, these will be designated only for students. Figure 1 simplifies the advantages of using Limited Use Limited Accessibility elevators.

Limited Use Limited Accessibility Elevators	Specially designed to accommodate people with disabilities; ADA compliant
	Built to Fit. LuLa models are designed to be installed in small spaces if necessary.
	Requires less frequent maintenance, saves money in the long run.
	Construction of LuLa Elevators are simple and does not require concrete hoistways; can be made of wood or even gypsum boards
	Takes up less space than ordinary elevators.

Figure 1: Shows how the advantages of implementing Lu/La elevators

Task 2: Present our proposal to the VP of Facilities and gain feedback - We will show our proposal for discussion. We want to raise awareness and spark a conversation among CCNY administrators. We want to demonstrate that this problem is significant and can be solved. After working out the details, our plan can move forward. We can budget and organize workers to install elevators with the CCNY staff. After gaining additional feedback and approval, the CCNY staff can begin gathering the money and resources to install the elevators. Figure 2 suggests the best time to begin the installation of the elevators.

Task 3: Fieldwork Analysis - We observe and listen to feedback from students and faculty. We would collect data such as maintenance costs, repair times, wait times, and student satisfaction.

Task 4: Make a report - All of our data will be collected together. The report is then sent back to the David Robinson (VP of Facilities) for future references; for it may be possible that other buildings like Shepard Hall suffer the same problems with elevators.

Schedule

Activity	Start Date	End Date
Task 1: Research the most appropriate elevators.	Nov 11	Nov 18
Task 2: Present our proposal to the VP of Facilities, gain feedback, budget, and organize staff to install elevators.	Nov 18	Feb 1
Task 3: Fieldwork Analysis.	Feb 2	Mar 28
Task 4: Compile a report.	Mar 29	Apr 15

Figure 2: Presents proposed dates. These dates have been selected due to what we believe are the best dates to begin construction. The presence of students and faculty is at its minimum during these times on campus.

Budget

Table 1 shows the total cost of installing a new elevator shaft, material expenses, and labor costs. The second table shows the lowered maintenance costs and how much money will be saved in relation to the current set up. With one more elevator shaft in place, the original elevator and escalator will require less maintenance due to a decreased amount of use.

Maintenance	\$10,000
Net operating cost	\$5,000
Elevator cost	\$200,000
Labor cost	\$25,000
Total cost	\$240,000

Table 1: Total cost of installing the new elevator shaft. [2]

Set up	Maintenance	Operation	In 4 years
Current set up	\$250,000	\$25,000	\$1,100,000
After change	\$175,000	\$30,000	\$820,000
Savings	\$75,000	\$-5,000	\$280,000

Table 2: Savings in a 4 -year span due to lowered maintenance costs. [3]

After four years of operation, the return on investment is evident and can be seen in Table 2. The plan we propose is feasible and needs to be done.

Qualifications and Experience

We are undergraduate engineering students at City College with various levels of professional and in-class experience.

- Carter Le, freshman electrical engineering major, has experience in budgeting high school clubs and editing the school newspaper.
- Genesis Olivero, Electronic technology AAS graduated from Bronx Community College, a transfer student majoring in Electrical engineering.
- Anvajron Nurakhunov, structural engineering major, a transfer student from College of Staten Island
- Miguel Gomez: Graduated from LaGuardia Community College with an AS. Currently enrolled in City College; major in Civil Engineering.

References

1. Giuffrida, Angela. "Football Fans Injured in 'Apocalyptic' Rome Escalator Collapse." The Guardian. Guardian News and Media, October 23, 2018. <https://www.theguardian.com/world/2018/oct/23/hurt-in-rome-metro-escalator-incident>.
2. "How Much Does a Commercial Elevator Cost?" Reference. IAC Publishing. Accessed November 18, 2019. <https://www.reference.com/business-finance/much-commercial-elevator-cost-90a21afdb7cd32c4>.
3. Larsen, Laurel. "10 Tips for Your Elevator Maintenance Contract." ElevatorLab, September 12, 2019. <https://www.elevatorlab.com/blog/10-tips-elevator-maintenance-contracts>.