

Analysis and Optimization of Employee Parking for Company XYZ

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Abstract

Company XYZ has the need to reduce costs and improve personnel safety. Current parking accommodations are costly and unsecure. To resolve this issues three possible solutions were analyzed: parking re-distribution, construction of a multi-level parking garage, and an environmentally friendly solution.

Key Terms

Alternate transportation, Telework, commute

Introduction

Company XYZ was established in 1996 to regulate the telecommunications industry and provide services to its clients. At first instance, the company rented offices on a building in Hato Rey, Puerto Rico. As the company grew, it had the necessity to secure larger offices that would accommodate the company's needs. By 2007, the company acquired a building (Figure 1) in San Juan, Puerto Rico to hold its new headquarters. The building was improved and renovated for the eighty-seven (87) employees at the time and left room to grow. Even though the building was suitable to its employees, its parking lot did not provide the same benefits. At the time, the solution was to rent additional parking off-site across the avenue from the company's premises.

Problem

From the beginning the premises' parking lot (Figure 1) was not fit to accommodate every employee and it was necessary to acquire additional parking spaces in an off-site lot.

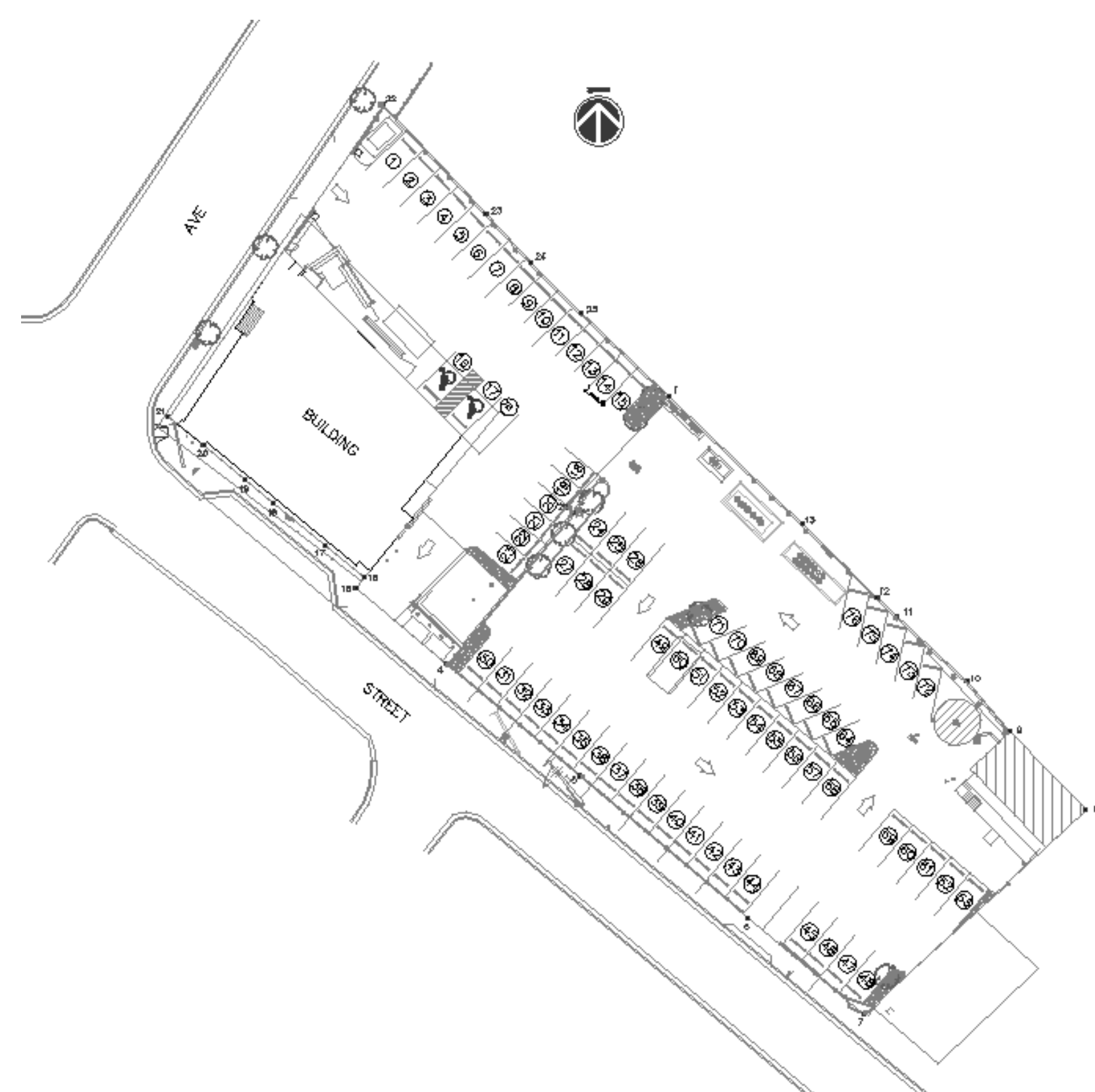


Figure 1. Company XYZ premises

In the last few years, the company has grown from eighty-seven (87) employees to ninety-nine (99) employees, therefore increasing costs for parking. In addition, the off-site parking lot is not as secure as the premises' lot. The off-site parking lot is located across the high traffic avenue from the building putting at risk the employees who use it. Furthermore, the premises' parking lot does not meet the American Disability Association (ADA) for handicapped parking spaces. ADA requires four (4) for seventy-six (76) to a hundred (100) parking spaces, and currently the company provides only two (2) handicapped spaces. Budgets cuts, the recession and the need to comply with ADA's requirements have forced the company to look for a more suitable parking scenario.

Methodology

Three (3) scenarios were evaluated hoping to find a suitable solution for the company's problem. First, a re-distribution of the current parking spaces was evaluated. This consisted in the removal of the visitor's parking and contract parking on-site. The second scenario evaluated was the construction of a multi-level parking garage on-site. Finally, an environmentally friendly scenario was evaluated. This scenario evaluated several commuter benefit programs and/or employer sponsored trip reduction that could fit the company's needs.

Parking Re-distribution

The current on-site parking scenario is as follows: four (4) visitors spaces, two (2) handicapped spaces, six (6) company cars spaces, and sixty-six (66) employee spaces for a total of seventy-eight (78) parking spaces. In addition, the company rents thirty (30) spaces and pays daily for five (5) additional spaces on an off-site parking lot. For each of the rented spaces the company pays \$107.00 per month. The company pays an average of \$8.00 per day for each of the additional spaces. Therefore, the total monthly cost for off-site parking is about \$4,010.00.

To maximize the parking distribution the following options were proposed:

- Remove visitors' parking.
- Remove contract personnel at on-site parking.
- Reassign unused parking space, including available company car parking space.

If the three proposed options were implemented (as shown in Figure 2), with the on-site parking lot would have a total of eighty-three (83) parking spaces. This would include the current two (2) handicapped spaces, five (5) company car spaces and seventy-six (76) employee spaces. Since the company has eighty-one (81) employees, this scenario will

reduce the need to pay for off-site parking from thirty-six (36) spaces to five (5) spaces. This means that the company would reduce its parking costs from \$4,010.00 to \$500.00 per month, which represents a reduction of 87.53%.

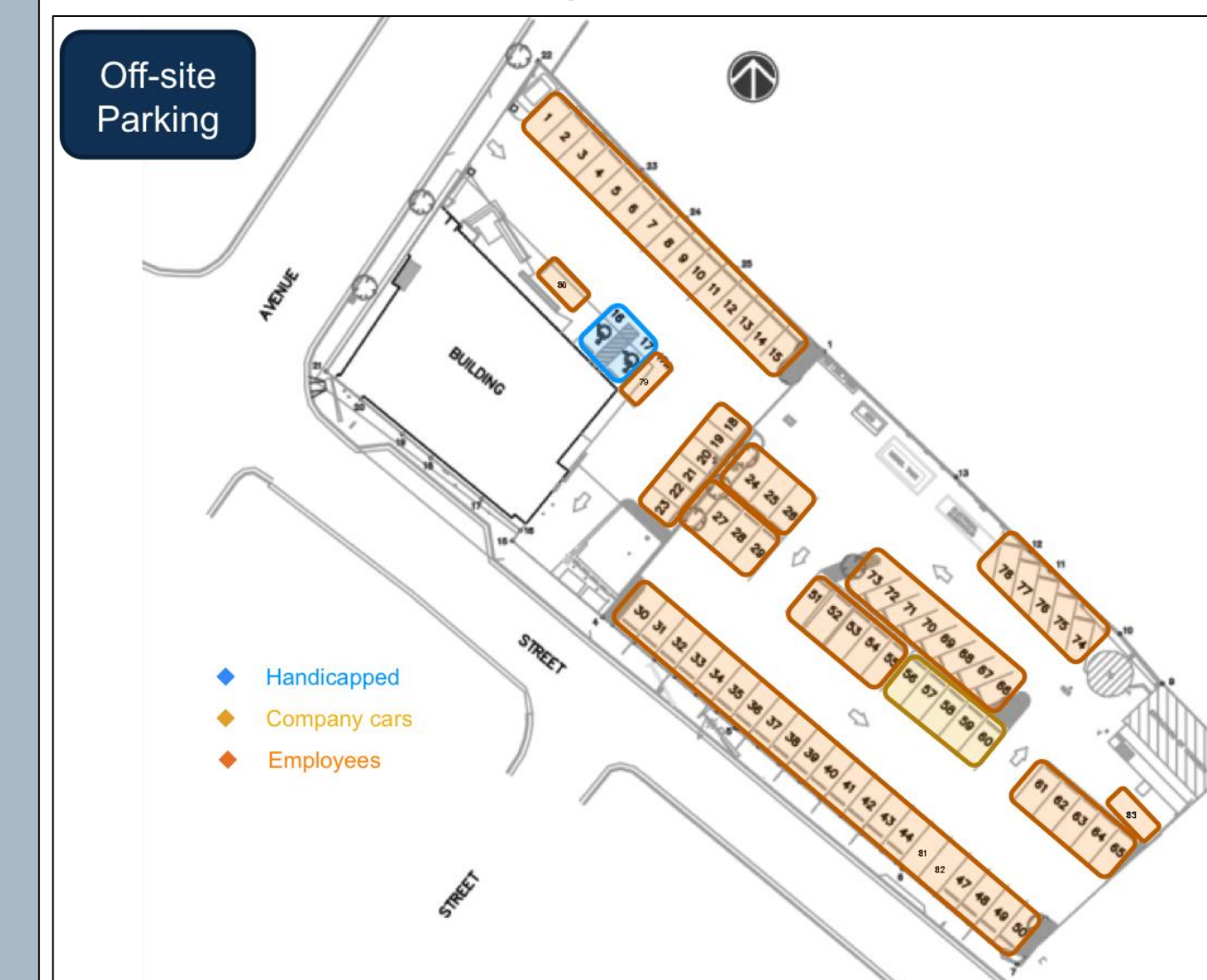


Figure 2. Proposed parking redistribution

Multi-Level Parking Garage

As part of the design for the renovation of the company's building, a multi-level parking garage design was prepared. This design considered using the current parking lot for a five (5) story parking garage.

To determine if the construction of a multi-level parking garage is a viable solution, a construction cost estimate was done with the tool RSMMeans Online (see Figure 3). The cost estimate for a five (5) story parking garage to be built in San Juan, Puerto Rico will be \$4,720,000.00.

Building Parameters	
Model:	Garage, Parking with Reinforced Concrete / Steel Frame
Location:	SAN JUAN, PR
Stories (St.):	5
Story Height:	10
Floor Area:	72,250
Reinforced:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$65.33
Building Cost:	\$4,720,000.00

Figure 3. Multi-Level parking garage cost estimate

This scenario would solve all of the company's problems regarding the parking situation. However, this scenario is costly and the company is trying to reduce costs. Comparing current costs with the cost estimate it would take ninety-eight (98) years to benefit from the investment. This analysis does not take into consideration the construction logistics and indirect costs, like renting temporary parking spaces during construction. If these lasts were added to the construction costs it would be even higher.

Environment-friendly program

It seems imperative that new transportation options be developed and implemented in order to help alleviate the worsening air quality and the public health problems related to it. After evaluating alternative transportation programs among different worldwide companies, four (4) programs were selected to be evaluated for the company, as shown in Figure 4.

Commuter Program (Carpooling)	Mass transit (Tren Urbano / AMA)	Shuttle (Vanpool)	Telework
<ul style="list-style-type: none"> • Incentive for Employees who carpool 	<ul style="list-style-type: none"> • 90 days Unlimited Use Cards: \$67.50 (Monthly \$22.50) 	<ul style="list-style-type: none"> • 2 Mini-vans (6 passengers each) 	<ul style="list-style-type: none"> • 21 employees working half-time from home
<ul style="list-style-type: none"> • Pros: More available parking, reduction in carbon foot print 	<ul style="list-style-type: none"> • Pros: More available parking, reduction in carbon foot print 	<ul style="list-style-type: none"> • Pros: More available parking, reduction in carbon foot print 	<ul style="list-style-type: none"> • Pros: Appealing to employees, More available parking, reduction in carbon foot print, saving in costs.
<ul style="list-style-type: none"> • Cons: Unappealing to employees. Not reliable, constant planning/ coordination 	<ul style="list-style-type: none"> • Cons: Unappealing to employees. Not reliable, constant planning/ coordination, time 	<ul style="list-style-type: none"> • Cons: Unappealing to employees. Costly, not reliable, constant planning/ coordination, time 	<ul style="list-style-type: none"> • Cons: No room to grow

Figure 4. Commuter Benefit Programs and/or Employer Sponsored Trip Reduction

Out of the four (4) alternatives analyzed, telework seemed the more suitable option. The employee roll book was analyzed to determine how many employees would be suitable for telework. Data from the United States Environmental Protection Agency (EPA) establishes that the average passenger vehicle emits about 423 grams of CO₂ per mile. As the average of miles traveled daily by the company's employees is 43.05 miles, a total of 18,211.26 grams of CO₂ would not be emitted by each teleworker. Making this scenario extremely good for the environment. This scenario meets all requirements for the company's needs for parking and it's environmentally friendly, therefore it's the best option of it all.

Conclusion

Out of all the scenarios analyzed for the company's need and requirements the best choice would be the telework program. This setup would reduce 100% the off-site parking costs and would reduce significantly carbon emissions. In addition, it has the alternative to meet ADA's requirements.

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