

The Parking Lot

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Type: Design Project
Length: 4 weeks
Location: Take-Home; Graphics Lab

Summary

Students are requested to develop a means of improving the convenience of parking of campus. This project can be used to introduce first year students to several aspects of campus life. Parking is a major problem on most campuses. The student newspaper reports on many activities on the campus. It can be an important lesson for new students to be able to determine with accuracy "What is the real problem?"

Students must gather information, process the information, and determine what is the real problem definition.

ABET Descriptors

Engrg. Sci. Content: First Year Engineering
Type: System
Elements: Establish objectives, synthesis, analysis, evaluation
Features: Development of student creativity, open-ended, consideration of alternative solutions, feasibility considerations, detailed system descriptions
Constraints: Economics, safety, aesthetics, environmental impact
Effort: Individual

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The Campus Daily has run the following story after receiving continuing complaints from students that there is a shortage of parking spaces on campus:

STUDENTS REPORT SHORTAGE OF PARKING

The Department of Public Safety (DPS) records show that there are 3800 cars registered for the academic year. DPS traffic surveys performed in 1989 and 1991 show that typically 60% of the registered cars are on campus at any one time. Also, the Physical Plant engineers report that the capacity of current university parking lots, including the parking decks, is 3000 spaces. DPS reports that evening peak occupancy exceeds the daytime occupancy rates. University administration strongly believe that there is not a shortage of parking for student automobiles, but that students are not using parking lots which are remote from university classroom buildings.

Develop a means of improving the convenience of parking. Design a parking lot to provide more convenient parking.

- Identify space within the “central core” of the university.
- Consider traffic patterns when designing entrance/exit sections.
- Preserve university aesthetics by maintaining 30% green space in the immediate surrounding area.
- Large trees in Texas are rare, and are treasured for their cooling shade during 100+ weather; Preserve, if possible.

Submit a final report detailing your design by COB (Close of Business) on Friday, August 6, 1993. The report should include the following:

- a. Problem Statement and Limitations
- b. Preliminary Ideas (sketches and brief description)
- c. Analysis (sizes, space layout, cost, accessibility, aesthetics)
- d. Environmental and legal considerations.
- e. Implementation (final concept, calculations, drawings)

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Engineering Notes

Objectives/Comments:

This project can introduce first year students to several aspects of campus life. Parking is a major problem on most campuses. The student newspaper reports on many activities on the campus. It can be an important lesson for new students to be able to determine with accuracy "What is the real problem?" The technical material needed can be presented in the classical engineering graphics course.

Expected Outcomes:

Students must gather information, process the information, and determine what is the real problem definition.

Design Process. The student must follow a logical process in accomplishing the design. This design process must be reflected in the design report submitted.

Design Report. The student should provide detailed documentation on the design. The design report will reflect the steps taken in the design process used in solving the problem.

Product. The product in this case will be an engineering layout addressing the following considerations:

- a. Configuration of parking lot
- b. Configuration of individual parking spaces
- c. Identification of special features (small compact spaces, truck spaces, bus spaces, etc.)
- d. Sufficient lane width
- e. Traffic flow patterns
- f. Entrances and exits
- g. Green space calculation
- h. Tree preservation considerations

This project can easily be modified to fit individual campus features.

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Discussion/Follow Up:

This project requires little high-powered technology, but the real life aspects of the problem impact the solution. Students must

- determine what is defined as the central core,
- survey students on use,
- determine size of a parking space,
- determine allowable turning distances,
- recommended clearance between passing vehicles,
- entrance/exit requirements,
- and optimum number of spaces from different parking patterns.