

FAMU & FSU COLLEGE OF ENGINEERING
Department of Mechanical Engineering



EML 4551C – Senior Design – Fall 2012

Needs Assessment and Project Scope

Mobility Lift for European Insider Applications

Group # 19

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Project Sponsor: Harmar Mobility Inc.



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Identifying the Client

The client is Harmar Mobility. Harmar Mobility is a company which designs and manufactures mobility lifts.

Interaction with the Client

The client will be contacted via a phone call every other Friday. The agenda for the phone call will vary slightly from week to week, but it will mostly be an update on our progress, questions we may have about anything design related and anything else that needs to be discussed or clarified.

In addition, any reports that are turned in for the purpose of grading in this class, we intend to provide a copy to our client as well.

Lastly, the team has discussed and agreed upon visiting the Harmar Mobility facility once each semester.

Need Statement/Problem Statement

Harmar Mobility currently does not have a product that can compete in the European market. This is because the vehicles in the European market are much more compact than the United States market, preventing the current lift models from fitting into the vehicles. Our goal is to provide a solution for the individuals who transport themselves in smaller vehicles and require a mobility lift.

Customer Specific Needs and Expectations

The task is to design a lightweight, inside lift to compete in the European market. The specific needs given to us by the client are:

1. It should be light weight, and easy to handle.
2. It should have a standard fold down option, something like the David from B&S or Carolift 40.
3. Capacity of 60kg (130ish lbs), so you are between the 40kg (88 lbs) and the 90kg (198 lbs).
4. Motor needs to be as low as possible.
5. Adjustable boom height and length
6. Small remote control
7. Installable on passenger or driver side (Very important b/c of the UK)
8. Lightweight materials. AL055 is very heavy compared to European competitors.

After Speaking with the Harmar Mobility Representative, this is what will be expected of our team:

1. Become Familiar with Harmar products
 - a. Visit the Sarasota facility.
2. Perform Market Analysis on European competitors.
 - a. Evaluate product function/features
 - b. Evaluate product appearance
 - c. Identify product shortcomings
 - d. Estimate product cost (in US\$)
3. Develop Harmar Concept (to be equal to or better than competition)
 - a. Determine product criteria
 - i. Function/Features
 - ii. Appearance
 - iii. Estimate cost
4. Review with Harmar Team
 - a. Create 3D model
 - b. Perform FEA/Structural Analysis
5. Review with Harmar Team
6. Create 2D drawings
 - a. Conduct Drawing review with Harmar Engineering
 - i. Conference Call or in person
7. Obtain quotes for all components
 - a. Create Bill of Material
 - b. Create cost summary
8. Build Prototype unit
9. Perform tests
 - a. Static Load test
 - i. Verify unit is able to lift 3 times the rated capacity (390 lbs)

- b. Cycle Test
 - i. Unit must perform 10,000 cycles with rated capacity
10. Sell thousands of units in Europe each year!