Estimated Costs of Recycling Processing

- Assumptions:
  - Cost of Hulk - approx. $50
  - 70 ton/hr shredder
  - 8 hrs/day operation
  - 4 hrs/day maintenance
  - Transportation Costs - $0.10/ton/mi

- Regression: Cost / Vehicle

Cost = -48.7820 - 0.0153 F - 0.0079 N - 0.0072 U

Where:
- F = Car Ferrous Mass (lbs)
- N = Car Non-Ferrous Mass (lb) (not including lead)
- U = Car Unrecyclable Mass (lb)

Rules of Thumb For Revenue & Landfill Expenses

- Cost of Landfill --- $120/ton
- Value of Ferrous Scrap --- $100/ton
- Value of Mixed Nonferrous Scrap --- $900/ton
- Separation Efficiencies --- 90% of ferrous recovered
  90% of nonferrous recovered
  rest goes to landfill

Dismantlers Get Some Off Before The Shredder:
  50% of the Iron
  80% of the Stainless
  50% of the Aluminum
  25% of the Copper
  50% of the Glass
  50% of the Rubber

This is a function of the kinds of parts made of these materials.

For the purposes of this analysis, use the regressions to calculate the costs of the baseline vehicle. Then use the top 4 bullet facts to look at the impact of changes in the vehicle material composition.
Ferrous Metal Revenue - Estimated

- Assumed
  - $100/ton shredded steel scrap
  - Standard Processing

- Regression Results From Cost Model

- Where (all in pounds):
  - \( F \) = total ferrous mass of car
  - \( N \) = total nonferrous mass (net of battery lead)
  - \( U \) = total mass of unrecyclable

- Result: in dollars per vehicle

\[
2.2248 + 0.0376 F + 0.0055 N - 0.0068 U = \text{Ferrous Revenue}
\]

Non-Ferrous Metal Revenues - Estimated

- More Detailed Estimate

- Recovery Rates of Aluminum, Copper, and Zinc Different

- Overall Mixed Metal Scrap Value
  Assumed At $0.45/lb

- Result: Dollars per vehicle:

\[
\text{Revenue} = 0.2025 \text{ Al} + 0.3038 \text{ Cu} + 0.4050 \text{ Zn}
\]

- Where:
  - \( \text{Al} \) = total aluminum in car
  - \( \text{Cu} \) = total copper in car
  - \( \text{Zn} \) = total zinc in car

- Note: Aluminum companies are being pressed to offer higher scrap values!
Landfill Cost Estimate

Assumptions:
- Landfill Cost - $120/ton
- Separations Not 100% Efficient

Results: Landfill Cost Per Vehicle

Cost = $6.9382 - 0.0018 F + 0.0041 N - 0.0574 U

Where:
- F = Car Ferrous Mass (lbs)
- N = Car Non-Ferrous Mass (lb) (not including lead)
- U = Car Unrecyclable Mass (lb)